University of Alberta

Organizational Learning in a Centre for Fire and Emergency Training: Examining Knowledge Creating Activity

by

Roger Mark Biddle ©

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In loving memory of my parents,
Rev. Roger Biddle and Opal Margaret Biddle,

and to my brother, Stephen Biddle,
who still remembers me when I was little.

ABSTRACT

This study explored conditions that fostered organizational learning in a high reliability organization, the Centre for Fire and Emergency Training (CFET) using an interpretive qualitative method. The case study was grounded in on-site observation of individual and group interactions, in depth interviews, and archival research.

The study asked, "How is organizational learning fostered in a high reliability organization? And "In particular, how does organizational learning foster innovation in this organization?" Subsequent questions focused on how organizational learning occurred, how it was valued, the conditions that fostered organizational learning, and how organizational learning traveled in the organization. Also, I wanted to study the collective processes that constitute organizational learning activities, rather than maintain the focus on individual cognition that is present in much research literature. I explored how new information moved through an organization and became accessible to members of the organization through learning processes.

Organizational culture was a significant influence on the organizational learning evident in themes such as the traditional culture of fire fighters, leaving government to be a self-sustaining organization, the critical role of trust in community, and learning to adjust to the many changes that occurred in the organization. These themes shaped practices and attitudes of organizational members at CFET, but cultural support was not sufficient to meet the challenges.

Organizational learning was required to bridge the work related differences present in the organization. This learning led to three innovations: learning to function as

coordinated teams, developing the capacity to meet client needs, and developing a modular curriculum.

The study shows evidence that these innovations were the result of networks involving people and technologies in which new information was created and flowed through the organization. From these findings it was concluded that organizational learning was a knowledge creating activity involving new information, networks and intermediaries (people and resources), and movement in which information traveled through the organization in a cycle of continuous negotiation.

These findings have important implications not only for organizational learning theory, but also will provide managers and administrators insight into the conditions that foster organizational learning and how innovations travel through organizations.

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CHAPTER ONE

INTRODUCTION

This study will argue that organizational learning (OL) is a discovery activity involving interdependent human as well as non-human entities from across the organization. Rather than a linear model of problem solving or a facilitated process that is pushed through an organization, this study understands OL as a cycle of negotiation. In this cycle participants create and circulate new knowledge, transforming it in their interactions.

The study contributes to ongoing OL conversations in several ways. First, it draws from two different literature streams, organizational and educational theory, to present a synthesis underscoring the interactive and participatory aspects of organizational learning. Second, since prior empirical work has focused primarily on occupational groups, this study chose to examine cross-department and cross-work dynamics to understand the conditions that fostered OL. Third, the study adds to existing literature by presenting an inductive empirical investigation using data driven analysis that sheds light on OL as a process comprised of three elements: new knowledge, networks, and a cycle of negotiation. Fourth, this study also contributes to the existing understanding of OL and organizational culture, and extends this literature by providing an empirical case and analysis explicating how the malleability of organizational culture facilitates change and innovation.

Why Study Organizational Learning?

The study of organizational learning is a study of knowledge creating activity that occurs within an organization. Knowledge creating activity involves processes that create, acknowledge, and utilize new information in the organization. These processes not only help to reveal new information, they also create connections and energy that enables the movement of learning through the organization. Everyday, people in organizations devote hours to participating in teams, planning, discussing, working, thinking, or exploring. Involvement in an organization provides individuals not only a means to earn a living, but also an environment in which people share relationships. In this environment individuals learn as they experience events, share interactions, gain skills, and form attachments. However, more than individual learning is involved; the collective learns too, at the level of small groups as well as the larger organizational community.

It seems reasonable to believe that organizational learning has occurred as long as organizations have brought individuals together to participate in joint activities and pursue common purposes. But the study of organizational learning has emerged only during the past four decades. In this brief period a varied and diverse number of researchers have engaged in defining, describing, and diagnosing organizational learning. No single reason explains why such a multi-disciplinary group has been attracted to study organizational learning. The wide range of researchers includes not only persons motivated to find competitive corporate advantages that sustain a business (Prahalad & Hamel, 1990), but also those persons who seek to foster fair, equitable, and democratic practices in work and learning communities (Coopey & Burgoyne, 2000). Perhaps what attracts persons to study OL is their curiosity to explain a phenomenon that sometimes occurs by happenstance and at other times is strategically planned. This study emerged from a similar curiosity, and in this section I describe features and issues of OL that led to my research question.

There is ample evidence suggesting that often OL has been by happenstance, such as the day a worker at Proctor and Gamble went to lunch, forgetting to turn off the stirring mechanism during the soap making cycle. Upon returning from lunch, the worker, unaware of any change in the product, poured, packaged and shipped the soap to buyers. Within weeks Proctor and Gamble was inundated with requests for more of the "white soap that floats" (Proctor&Gamble, 2004). The unintended consequence of the worker's neglect caused more air to be mixed into the soap, resulting in bars of soap that floated in water. To meet these requests Proctor and Gamble needed to learn how to intentionally make the soap that floats. As a result of happenstance, Ivory soap became one of the great business success stories of the late nineteenth and early twentieth centuries.

Organizational learning also can be strategic and intentional. In 1985 the United States Army created the Center for Army Lessons Learned (CALL), which is responsible for learning from ongoing missions (Thomas, Sussman, & Henderson, 2001). In 1994 the US invaded Haiti using land forces based from an aircraft carrier, the first time that land forces launched an invasion from an aircraft carrier. CALL brought together experts to study the ongoing military action and to make recommendations to improve coordination efforts between the military units. The invasion plan included the subsequent transfer of command from the 10th Mountain Division troops who had occupied the island, to the 25th Infantry Division, a unit better equipped for maintaining ongoing stability and coordination with civilian authorities. OL was intentionally structured through Active Action Reviews (AAR) drawn from real time events, brain storming with a multicultural panel of experts, reflection and priority learning assessment by decision makers, and a production team to disseminate the lessons learned within 48 hours. The learning from the ongoing processes was categorized, disseminated to the incoming units, and subsequently stored for retrieval to be used at a later time. This type of strategic organizational learning does not occur by chance. Strategic organizational learning is intentional and uses ongoing dedicated resources. The CALL centre has been an important means for the US army to improve communication, achieve efficiencies, reduce casualties, ensure smooth transfer of command, and develop innovations. Based on newspaper accounts of US military action in Afghanistan, it appears that the lessons learned in Haiti may have been applied in Afghanistan when the US Marines and the 10^{th} Mountain Division engaged in a similar military action and transfer of forces.

Organizational learning is not always successful and may be contested or vulnerable to resistive power or manipulation of intended changes. A poignant example of dysfunctional organizational learning is the case of the explosion of the space shuttle Challenger. One view as to why the tragedy occurred focused on the influence of "groupthink," a process in which a preferred view dominates alternative views (Nelson & Quick, 1997). Further analysis has shown that the organizational response, particularly the safety systems put in place to regulate and protect NASA projects, were characterized by poor communication, inadequate handling of information, faulty technical decision-making, and a failure to comply with regulations (Vaughan, 1990). In this tragic example, not only did organizational learning fail to prevent the accident, the learning processes may have contributed to the event. The recent Columbia shuttle disaster echoes similar lessons that were never absorbed from the 1986 explosion (Sanger, 2003).

The Challenger and Columbia disasters are poignant examples demonstrating the unintended consequences that occur when an organization fails to learn. Organizational learning is important in the context of expanding opportunities and pressures of a fast paced, technology oriented world economy, but it is no longer adequate for organizations to learn by trial and error (Billet & Boud, 2001). Immediate debriefing sessions such as the Active Action Reviews suggest that trial and error learning from experience is important, but attention to other organizational learning activities is required to ensure successful adaptation, foster efficiencies, discover new products, or sustain core organizational learning advantages.

Organizational learning is a means to understand how one organization can turn a mistake into a benefit, where another organization might blame, find fault, or reproduce problems. OL focuses attention onto the actions, tools and thoughts of individuals, groups, departments and the organization. I am interested in studying organizational learning by examining actual relationships and critical learning opportunities in a specific context or situation. The critical learning events are events that are noticeable because the learning contributed to improved communication, enhanced productivity, or altered behavior in the organization. Whitehead described how an individual could have potentially unlimited options, but the actualized choices were the ones that brought shape and form to reality (Whitehead, 1967). I believe that the same is also true for organizations. In organizations choices do not occur in isolated instances, but become a fabric of events linking people, ideas, technology, and organizational systems. I am interested in understanding how learning is fostered in a specific context and situation to understand what Kofman and Senge (1993) suggest can be alternative ways of working and living together. The next section briefly outlines the theoretical position I adopted to design and conduct my study.

Organizational Learning as Knowledge Creating Activity

Researchers across a wide range of academic disciplines have studied organizations to identify the processes that foster and inhibit organizational learning. These works have identified OL concepts such as improvisation (Weick & Westley, 1996), stored information (Huber, 1991), conversational patterns (Roth, 2000), reflection (Argyris, 1991; Weick & Westley, 1996) and innovation (Brown & Duguid, 1991). However, in spite of the explosion of interest in organizational learning, researchers have found it difficult to ground organizational learning in activities that link theoretical concepts and experience (Walsh, 1995; Weick & Westley, 1996). I wanted to study the collective processes that constitute knowledge creating activities, rather than maintain the focus on individual cognition that is present in much research literature, which tends to represent OL as a sum of separate individual acts. I wanted to explore how new information moves through an organization and how new information becomes accessible to members of the organization.

This study examines OL as a knowledge creating activity occurring within an organization. A knowledge creating activity is a concept composed of three aspects: new information (Nonaka & Takeuchi, 1995) or changed assumptions (Kuwada, 1998), networks of human and non-human entities (Callon, 1986; Callon, Law, & Rip, 1985; Latour, 1991, 1992), and movement of OL across the organization (Gherardi & Nicolini, 2000). Below I briefly mention the conceptual framework I use to develop these aspects of new information, networks, and movement. In the following chapter I discuss these ideas in more detail.

New knowledge. Initially organizational learning becomes recognized when new knowledge is amplified and crystallized in the organization (Nonaka & Takeuchi, 1995). Amplification refers to the emphasis placed on OL and may represent a tension between an organization's short-term and long-term desires. For example, immediate short-term learning may be amplified over long-term learning because of an emphasis on immediate goals. Conversely, the long-term benefits might be stressed to justify a short-term disruption. In either case organizational learning becomes crystallized in knowledge creating activity. Crystallization implies a transformation in the sense that something is created from an aggregate solution. However, crystallization of a knowledge creating activity that takes shape in an idea, an argument, a proposal, or a business plan is a freeze frame in time and may be reconfigured at a latter time.

Often a new OL involves innovation. Innovation can be a new service or product (Dougherty, 1996) or a revision of basic assumptions about the purpose of the organization (Kuwada, 1998). In this study innovation is seen as new knowledge involving new services or products that is created within the organization.

Networks of human and non-human entities. Innovations that involved OL occurred through relationship networks that included human, non-human, language, and financial intermediaries. This understanding of networks and intermediaries draws upon a particular version of a socio-technical theory often referred to as actor network theory (Callon, 1991; Gherardi & Nicolini, 2000; Law & Hetherington, 2001). Central to the understanding of translation and networks is the notion of intermediaries. Gherardi and Nicolini draw on Callon's (1991) understanding of intermediaries. Callon suggested that intermediaries include: texts such as reports, books, articles and notes; artifacts such as machines, consumer goods, or software programs; humans and their skills, knowledge, and know-how; and money in its varied forms. Intermediaries are mediums that carry organizational learning. They both describe and give form to the networks.

Movement across an organization. In this study, the movement of organizational learning involved "translation" of ideas and information (Gherardi & Nicolini, 2000; Law & Hetherington, 2001). Translation occurred as a cycle of negotiation replacing existing practices and overcoming work related differences present in the organization. During the cycle of negotiation an idea traveled and acquired energy through the interactions of intermediaries. Rather than moving because of an external authority, the movement was self-generating and acquired energy as the idea was shared, accepted, rejected, or refined.

A second feature of the movement of innovation describes how innovation crosses a boundary that has not previously been crossed. Movement across a boundary challenges the organization's capacity to function. Orlikowski (2002) suggested that boundary challenges include geographic challenges (crossing provinces), temporal challenges (operating in different time zones), changing social relationships (working with different client practices and customs), political challenges (different industries, different government agencies and departments), as well as technical challenges (changes in operating procedures and software). Understanding movement across boundaries is an important link between networks and organizational learning. At these crossing points networks can successfully translate, align the differences that are apparent, or dissolve.

The spaces in which the different boundary challenges occur are important because if agreement is achieved there is alignment within the networks and the movement of OL. If there is not agreement, alignment of the different entities is broken and an organization's capacity to function in relationship to these challenges will be diminished.

Definitions

This study incorporates the following concepts:

> *Learning.* Learning is the process of constructing new knowledge, its ongoing reinforcement and enhancing its breath and organisation through deployment. (Billett, 2001)
>
> *Organizational learning.* Organizational learning is the participative process of creating new knowledge through recurrent and multifaceted negotiation across the different groupings in an organization.
>
> *Organization.* An organization is a formally coordinated effort that brings individuals together to participate in joint activities and to pursue common purposes.
>
> *Critical learning event.* A learning event that has contributed to enhanced productivity, improved communication, implemented policy changes, or altered behaviour patterns in the organization in a noticeable way (Roth, 1996).
>
> *Strategic learning.* Strategic learning aims to generate learning in support of future strategic initiatives that will, in turn, foster knowledge asymmetries that can lead to differences in organizational performance (Thomas et al., 2001). Strategic organizational learning is the capability to implement and sustain innovation, maximizing the learning capacity of the organization and reducing organizational barriers blocking knowledge transfer.
>
> *Innovation.* Innovation is the conceptualization, development, operationalization, manufacture, launch, and ongoing management of a new product or service (Dougherty, 1996).
>
> *Tacit knowledge.* Tacit knowledge is personal, context-specific, includes cognitive and technical elements, and is difficult to formalize and communicate. Nonaka and Takeuchi (1995).
>
> *High reliability organizations.* Organizations that operate under very trying conditions all the time and yet manage to have fewer than their fair share of accidents. (Weick & Sutcliffe, 2001)

Purpose of Study

This study examined the conditions fostering innovation in organizational learning in a high reliability organization: a fire and emergency training centre. High reliability organizations are organizations invested with significant public responsibilities that have catastrophic consequences in the event of failure. I explored interactions between an individual and a group as well as between different groups within the organization. I was interested in exploring how structural issues and environments influenced learning and how different organizational levels impacted learning. Finally, the study examined processes by which innovation was incorporated in the organization. Incorporation was the means by which these ideas traveled from a person, group, or department to the rest of the organization. Innovation in organizational learning identified new lessons learned in an organization. The organization learned as the lessons learned were embedded in ongoing processes and activities in the organization. In the case of Ivory soap, the learning also included how to alter the manufacturing process, and how to name, market, and distribute the new soap.

This study was guided by the following research questions:

> **How is organizational learning fostered in a high reliability organization?**
> **In particular, how does organizational learning foster innovation in *this organization?***

The following sub-questions helped to focus my data gathering and analysis:

1. How does OL occur?
    a. Is it planned? If so, by whom?
    b. How is OL distinguished from individual learning?

2. How is learning understood and valued in this organization?
    a. What learning is important to the organization?

3. What conditions and processes foster OL?
    a. How are employees engaged in organizational learning?
    b. Are there tensions present?
    c. What kinds of tensions?

4. How does organizational learning travel in the organization?
    a. What processes are involved in the dissemination of organizational learning?

The site for this research was the Centre for Fire and Emergency Training (CFET) in Western Canada, where I conducted a case study using on site observation, semi-structured interviews, and archival study.

Delimiting the Study

I write from an educational perspective: I am interested in understanding the organizational decisions that support or inhibit human development. An educational perspective on organizational learning underscores the importance of progressive growth and human development, but is also concerned with how learning is shaped in organizational activity, networks, community, and culture.

This research used a case study approach because it was a means to explore multiple perspectives and multiple personal experiences of individuals engaged in ongoing work at the CFET. The case study also provided a flexible means to observe emerging situations that occurred during the field research.

The study was delimited to the CFET, which was chosen as a site for four reasons. First, CFET has recently experienced challenges that have required significant organizational learning. Second, CFET has characteristics similar to other high reliability organizations. Other possible high reliability observation sites such as a gas well distribution site or mining operation were considered, but a particular advantage of the chosen site was the opportunity for direct engagement with individuals and group processes at all levels of the organization. Third, the proximity of the site influenced my choice. The observation site was within a three-hour drive making it possible to gather research and return home within a day as well as respond to opportunities for data collection emerging during the field research. Although I was able to meet several board members they were not interviewed. Also, I chose not to interview persons from the local community college. Since CFET functioned autonomously I did not think that interviewing representatives of the college would add significant information about organizational learning and the internal activities of the centre. Because the focus of the study was on the conditions that fostered organizational learning I did not interview students or alumni.

Finally the study was delimited to a period of ten months in which data was collected. This provided a small but rich slice of organizational live for study, but did not allow examination of historical trajectories, broader cultural changes, or events and people that may have been important to the organizational learning but that did not figure in the everyday goings-on of the period in which I collected the data.

Limitations of the Study

Limitations in this study were aspects that were beyond my control. One of the limitations was the demographics of the staff. Interviews were limited to opportunities available during work, but for the most part accessibility with staff was easily accomplished by making appointments. Only one interview was canceled due to a work related conflict. Staff demographics and the decisions made regarding sample selection are explained later in the paper.

Additional limitations related to my lack of experience with the fire fighting culture and thus my reliance on my observations and interpretations without much cultural experience or knowledge. The study also was limited to what people felt comfortable sharing with me as a cultural outsider and temporary visitor. Another limitation was how much could be said during the interviews. Even though some interviews extended beyond the agreed upon time of sixty minutes, the time did not allow much in-depth exploration of each person's meanings and perspectives regarding the everyday life under observation.

A general limitation of the study was the interpretive bias any observer brings to ethnography, focusing on certain events and interactions that appear significant and, perhaps equally significant, missing aspects that some other observer might emphasize.

Significance of Study

This study expands previous OL research in two areas. First, I expand on the work of Nonaka and Takeuchi (1995), but rather than describing OL as a new creation by individuals, this study explored how innovation became embedded in the collective organization rather than in individuals. Second, the study expands on the translation model of Gherardi and Nicolini (1999, 2000). Gherardi and Nicolini (1999) described OL as circulation of different safety understandings, but their study did not describe innovation nor show how lessons that were learned moved from one part of an organization to another. Such movement of OL within the organization can be explained as a cycle of negotiation that spirals through the organization.

Understanding how OL moves through an organization could also contribute to understanding innovation because of attention given to the cultural conditions of a knowledge creating activity. These conditions include such intangibles as trust, communication skills, and relationships as well as tangibles such as software packages, boundary crossing, coaching, and Internet access.

Leaders and administrators, in addition to understanding conditions that foster organizational learning, might also find this work helpful because of attention devoted to understanding the movement of organizational learning across boundaries. Boundary crossing has been shown to be significant in high tech organizations (Coe & Bunnell, 2003) and as a means to increase capacity in organizations (Orlikowski, 2002). Because this study is a case study of organizational learning that crosses boundaries, readers should be able to identify salient aspects of OL across boundaries.

Two other groups that could benefit from this study are fire school training centres and government agencies responsible for oversight of fire and emergency training. These groups might find the study helpful because it shows particular activities that foster and inhibit organizational learning, and provides insight into administrative issues in the larger context of organizational learning and fire fighting culture. For example, government officials responsible for educational programs might be attentive to the important role that cultural context provides in training fire fighters, and as a result, ensure that a fire fighting centre is supported by management that understands and supports the fire fighting culture.

Thesis Overview

Chapter One outlines the purpose and potential significance of this study, describes why I became interested in organizational learning, what questions and concepts that guided me during the research, and briefly explains organizational learning as knowledge creating activity.

Chapter Two presents the theoretical context for the study, selecting and contrasting two research streams from the broad background of OL literature: organizational theory and educational theory. In Chapter Two I outline of five broad sociological traditions identified by Gherardi and Nicolini (2001) and then conclude the chapter by contrasting two research streams from the broad background of OL literature: organizational theory and educational theory.

Chapter Three outlines the methodology used in the study. I have used a qualitative case study approach to observe and interview persons and groups in the organization. The case study approach also allowed me to study the organization in light of the actual words and experiences of those in the organization.

Chapter Four describes the culture of the organization. The chapter first explores the broad characteristics of a fire fighting culture, and then presents the particular cultural themes that impact the organization.

Chapter Five presents findings of the study that support my argument that OL is a knowledge creating activity. Findings from the study illustrate OL that is new knowledge created within the organization, knowledge linked in networks by human and non-human intermediaries, and activity that represents a continuous cycle of negotiation.

Chapter Six concludes the thesis with a discussion of the contributions and implications of this research for organizational learning theory, and suggests possible areas for further research.

CHAPTER TWO

RESEARCH IN ORGANIZATIONAL LEARNING

This chapter reviews research on organizational learning and highlights two particular research areas I draw from to develop a conceptual framework for understanding OL as knowledge creating activity. First, I describe the expanding field of OL research and the attempts to define and categorize the contribution of different disciplines. Second, I select and contrast two research areas, organizational and educational theory, and show how each of these areas attends to different understandings of organizational learning. Finally, I conclude this chapter by describing a conceptual framework integrating the literature from these two areas to understand organizational learning as knowledge creating activity.

OL: An Expanding Research Field

Interest in organizational learning as a research field has grown rapidly during the last thirty years. Early OL researchers seemed to believe that organizational learning was the result of trial and error learning. Stemming from work undertaken by the Boston Consulting Group (BCG) that studied the semiconductor industry during the 1970s, researchers initially thought that early entry into an industry created organizational learning advantages. Firms that were first to market a product achieved learning advantages over other firms, resulting in increased market share and cost reductions (Leavy, 1998).

By the mid-eighties research interest in organizational learning waned. Lieberman and Montgomery (1988) concluded that first mover learning advantages were not sustainable because such advantages quickly spread across firms and industries through mechanisms of diffusion such as workforce mobility, research publications, informal technical communication, reverse engineering, and plant tours. By the late 1980s a consensus developed that learning-based advantages were not likely to help a firm achieve a sustained advantage (Lieberman & Montgomery, 1988; Weick & Quinn, 1999).

This consensus was dramatically altered during the 1990s. Spurred by the publication of Senge's *The Fifth Discipline* and research showing the growth potential enabled by the company's core learning competencies (Prahalad & Hamel, 1990) interest in OL increased. The interest was evident in the increasing number of articles published—those published in 1993 alone equalled the total number of articles on OL published during the decade of the 1980s (Easterby-Smith, 2000).

As the interest in organizational learning increased during the 1990s the field of research expanded and now includes studies of organizations in different cultures and diverse disciplines. The publication of the *Handbook of Organizational Learning and Knowledge* (2001) is representative of this expanded field, which includes a strong European and Japanese perspective on OL. The expansion of organizational learning has been extensive and grown from a focus on trial and error experiences to understanding systemic aspects of the organizational learning process. Now organizational learning research includes many disciplines and ongoing debates (Easterby-Smith, 1997, 2000). In the following sub-sections I explore attempts to define and categorize organizational learning.

Defining organizational learning. Although OL definitions range from an emphasis on individual cognition suggested by Huber (1991) to an emphasis on OL situated in collective practices of the organization as described by Cook and Yanow

(1993) or Lave and Wenger (1991), there is yet to be a consensus as to what defines OL (Easterby-Smith, 2000). Other researchers have defined OL as action through better knowledge and understanding (Fiol & Lyles, 1985), or as the process of detecting and correcting error (Argyris, 1993). Finding consensus as to what defines OL is difficult because learning is embedded in tacit and cultural practices as well as organizational activities and artifacts (Bell, Whitwell, & Lukas, 2002; Cook & Yanow, 1993; Easterby-Smith, 2000; Weick & Westley, 1996). Rather than emphasize a singular definition of organizational learning Easterby-Smith, Crossan, and Nicolini (2000) argued that it was valuable to have multiple definitions of organizational learning to represent the diversity of the communities of practice in which organizational learning occurs.

The concept of individual cognition tends to be a prominent aspect of OL definitions. The definition of OL provided by Huber (1991) suggested that "*An organization learns if any of its units acquires knowledge that it recognizes as potentially useful for the organization* (emphasis in original)" (Huber, 1991). Huber did not think that knowledge necessarily represented a behavioral change in the organization, but only that the knowledge was potentially useful. This definition emphasized knowledge that organizational units acquired, stored, or retrieved. Such an emphasis suggests that knowledge is an object existing separate from its context and use rather than processes. Also, because Huber based his understanding of knowledge on the notion of individual cognition, his definition of OL suggests that knowledge is the product of individual cognition. Huber's discussion, however, did not address two conditions present in his definition: the conjunction "if" and the word "recognizes." The conjunction "if" suggests that more than objective knowledge is involved; there is an interaction or exchange necessary for the organizational learning to occur. The term "recognizes" suggests a social process and involves questions about the social nature of the community, the power relations present, and how learning is moved through an organization. Huber was content to define organizational learning as a knowledge object. However, the exchange of information is crucial because it underscores the importance of OL processes in shaping what is considered learning. Huber's definition is insufficient because it relies on the perception that learning is cognitive knowledge acquired in a linear fashion and does not call attention to organizational dynamics of learning, dynamics that are non-linear. Another difficulty with Huber's definition is that although it assumes that OL can spread across the organization as people acquire the stored information, the definition doesn't reveal processes and relationships that enable OL to travel.

Other researchers such as Brown and Duguid (1991) and Lave and Wenger (1991) presented another view of OL that located learning not in individual cognition but in the collective experience of persons in communities of practice. Lave and Wenger (1991) presented examples of learning in situated practices suggesting that organizational learning involves social relationships, experiences, personal identity, and language. This collective nature of OL incorporating both tacit and cultural aspects of learning was evident in Cook and Yanow's (1993) study of flute making. They suggested "Organizational learning is the acquiring, sustaining, and changing, through collective actions, of the meanings embedded in the organization's cultural artifacts" (Cook & Yanow, 1993, p. 384). This definition recognized the tacit qualities of organizational learning that are acquired through group interactions. Cook and Yanow (1993) suggest that the energy for OL happens as individuals engage in their daily work activities crafting flutes. Such collective activity represents organizational learning that is shaped by the culture of the organization (Yanow, 2000).

Although many have attempted to define organizational learning and have described the phenomenon, there have been few studies such as Cook and Yanow's (1993) study that integrate theory of organizational learning with analysis of actual organizational practices (Matthews & Candy, 1999). Recently, Gherardi and Nicolini (2000) introduced a translation model explaining organizational learning based on their study of safety knowledge developed in an organization. Gherardi and Nicolini (2000) explored how OL traveled through an organization. Safety practices, they explain, can become translated to safer equipment, which may also be translated into safety codes. The impression of movement seems to be indicated in the phrase "mechanism of diffusion" used by Lieberman and Montgomery (1988) to underscore the idea that OL traveled across organizations, but the phrase does not explain how the energy for the movement was sustained. Gherardi and Nicolini (2000) draw on actor-network theory to suggest that OL movement is a process of translation that occurs through intermediaries. Using the work of Callon (1991) and Latour (1992), Gherardi and Nicolini (2000) distinguish between diffusion processes, driven by an external authority, and the translation model, in which energy is created by the internal authority found in the interactions that occur within the organization.

The translation model shifted the understanding of organizational learning from an emphasis on individual cognition to focus instead on collective practices in the organization. Gherardi and Nicolini (2000) noted that the emphasis of OL that occurred in collective practices moved the conception of OL away from the dependence on a psychological model of learning to an understanding of OL grounded in sociological foundations. These sociological foundations offer constructs for categorizing the field of organizational learning and the particular OL understanding of each tradition.

Categorizing organizational learning. Gherardi and Nicolini (2001) explain the diversity of OL by describing five sociological traditions and the different perspective of OL brought by each tradition. These traditions include: conflict, rational-utilitarian, Durkheim, micro-interactionist, and postmodern writings. Because these five traditions represent the growth and diversity of OL research and describe the shift toward a sociological understanding of OL further discussion is warranted.

The conflict tradition draws from authors such as Marx, Engels, and Weber. The tradition has moved beyond the early conflict grounded in class or bureaucracy and includes recent authors who question the impact on learning that is created by new configurations of power and influence such as that represented by the emergent techno-scientific experts who combine the use of knowledge and the ability to persuade others to a particular viewpoint (Gherardi & Nicolini, 2001). Three themes characterize how organizational learning is impacted. First, OL may be influenced by the ideology of a particular power group such as the role that management has had in the development of organizational learning. A second theme relates to how organizational learning is impacted by policies that mobilize power in an organization. Mobilizing knowledge within organizations can create differences between those who have knowledge and those who do not. These knowledge differences become power differences. One historic example of this has been the rise of professions that has clearly divided those who have legitimated knowledge and those who don't. Finally, OL is shaped by the endeavours to manage tensions between learning and organizing. Tension exists between learning and organizing because learning increases variety and disorganization, but organizing attempts to reduce variety (Weick & Westley, 1996).

A second tradition is the rational-utilitarian view. The rational thought process occurs as an organization adapts to its environment. For example, engineers at NASA were challenged to identify the reasons why the Columbia and the Challenger exploded. The reasons represented a gap between the actual and the desired performance. NASA engineers set out to close the gap. OL seen from this point of view suggest that OL is problem driven. When a problem is noticed it activates a problem solving process that identifies the problem, divides the problem into separate parts, and proceeds to find solutions as to what has caused the problem. Another characteristic of the rational utilitarian view identifies organizational learning as an exchange relationship in which knowledge in the form of people, skills, or legal protection (contracts, patents etc.) becomes a commodity that a company owns or attempts to acquire. A study of Hollywood studios before and after the introduction of television depicts OL as an exchange relationship (Miller & Shamsie, 1996). Prior to the introduction of television, studios in Hollywood produced elaborate motion pictures. To design, build, and produce these productions, studios needed a large and stable staff including a dependable supply of established stars. Consequently production staff and Hollywood stars were acquired through long-term inflexible contracts that assured the studio of the needed services. After the advent of television the industry shifted to short-term productions and the movie studios geared to organizing diverse groups for short-term projects. Production staff and Hollywood stars no longer were employed through long-term contracts but were contracted for specific productions. Although staff and stars had greater flexibility there was less security. Such a system represents the rational utilitarian viewpoint of the exchange of knowledge and skill. Organizational learning in this tradition is problem driven, happens as the exchange network is activated, and occurs in the context of actions and routines rather than individual minds (Gherardi & Nicolini, 2001).

A third tradition identified by Gherardi and Nicolini (2001) was fostered by the work of sociologist Durkheim. The Durkheimian tradition continues to have an important focus in understanding OL. Those influenced by this view tend to see OL as the result of socialization into a specific community in a particular organizational culture. Learning is activated within the contexts of this socialization. There are four contexts: regulatory, educational, innovative, and interpersonal. Rather than the rational utilitarian conception of learning shaped by an exchange system involving skills and rewards, the Durkheimian tradition conceptualizes organizational learning as non-rational: learning occurs by socialization to a specific cultural code (Gherardi & Nicolini, 2001). Another characteristic of the Durkheimian tradition is the view that organizational learning is a result of changes introduced into the organization. Such a view suggests that there are particular ways to foster OL in a particular culture or setting.

A fourth tradition, the micro-interactionist tradition, is grounded in previous works that emphasize how an individual shapes his or her reality by projecting different aspects of oneself into the world (Goffman, 1967). The micro-interactionist approach frames OL as the "transmission of knowledge within occupational communities" (Gherardi & Nicolini, 2001). Whether one is a doctor, custodian, social worker, or movie star one not only participates in work, but also creates and sustains social identities and relationships. The social relationships are important and explain how knowledge is communicated whether it is about copy-machine repair (Brown & Duguid, 1991) or mid-wife training, navigation, or self-help groups (Brown & Duguid, 1991; Lave & Wenger, 1991). The contribution of the micro-interactionist view expands on the non-rational emphasis of the Durkheimian tradition, which emphasizes that the cultural context shapes the individual, to add that the cultural context also is shaped by the individuals' constructions.

Finally, Gherardi and Nicolini (2001) present a fifth area, the postmodern viewpoint. In this perspective three issues are relevant for organizational learning: the relationship between power and learning, the importance of discourse and practice, and fragmented identity (Gherardi & Nicolini, 2001). Power cannot be separated from organizational learning. Early OL studies often found important information that might benefit the learning and decision-making of an organization was often derailed by the career interests of those higher in the hierarchy of management (Argyris & Schön, 1978). The postmodern tradition highlights rather than overlooks the role that persons or social communities have in knowledge claims and stories within an organization. The postmodern tradition believes that such persons or communities have the ability to influence or persuade, and that such influence shapes the outcomes. One example of such influence by management was found in a study of Disney in which management told an idealized story of those working at Disneyland and under-represented the harsh working conditions of employees (Boje, 1995). The ability to influence and persuade is not a neutral act, but an expression of power in an organization.

Against the broad background of these five traditions identified by Gherardi and Nicolini (2001) I have selected for discussion here two streams of research literature that have contributed to the ongoing interest in organizational learning: organizational theory and educational theory. These streams were chosen because the contribution each stream makes links with a particular sociological tradition but also each stream provides a different understanding of OL. Organizational theory links with the rational utilitarian tradition in the emphasis on developing skills and exchanging skills in a work setting, but adds to the understanding of OL in the emphasis on the non-imitable value of learning that occurs in an organization. Also another contribution made by some organizational theorists recognizes how systems theory impacts OL in an entire system, much like a mobile is impacted even when touched at its outermost part. The contributions and limits of organizational theorists are discussed further in the following sections. Educational theorists I have selected seem to be most closely linked with the micro-interactionist and postmodern traditions outlined by Gherardi and Nicolini (2001) because of the emphasis given to different experiences and understandings, the emphasis on how learning is conceived, and questions about who benefits from a particular conception of learning. Educational theorists contribute to the understanding of OL by exploring processes that may inhibit OL and suggest alternative explanations of learning such as the difference between complicated and complexity learning. Educational theorists are explored more fully in a subsequent section.

Organizational Learning Research in Organizational Theory

This section highlights contributions organizational theorists have made to OL research including: the resource-based view of the firm, understanding learning processes, strategic organizational learning, complexity and the learning organization, and the impact of power on organizational learning. I have selected these contributions because they seem to link to the rational utilitarian tradition and extend the understanding of OL in specific ways.

Resource-based view of the firm. To understand the increased role of organizational learning research for organizational theory, it is relevant to recall that strategy researchers prior to the late 1980s minimized OL because managers believed that a firm's success was dependent on the firm's ability to identify and protect its niche within an industry. Often termed the structure-company-product (SCP) paradigm (Porter, 1980), the structural emphasis focused on production outcomes and control of markets. A firm succeeded by gaining the largest percentage of production in a market or by having a specialized niche not duplicated by others. In the SCP paradigm, organizational learning was of little interest because learning attended to internal resources that were thought to have minimal impact on the organizational product outcomes. In the SCP paradigm only the top managers of the organization were responsible for setting the strategy to attain sustainable advantages for the organization (Porter, 1980). In 1984 and continuing into the early 1990s organizational theorists, particularly researchers interested in strategy began to show the importance of internal firm capabilities such as organizational learning because these internal capabilities represented something unique to a business firm. This new perspective became known as the resource-based view of the firm.

The resource-based view of the firm identified the importance of specific firm resources for establishing sustained advantages (Barney, 1991; Wernerfelt, 1984). Learning, particularly learning that was unique to the firm, represented a non-imitable resource that enabled a firm to sustain competitive advantages (Miner & Mezia, 1996). One example of this new theory was Honda's organizational learning about high revolution engines. Organizational learning enabled the company to identify and retain its core learning competencies. According to Prahalad and Hamel (1990) core learning competencies was "the collective learning in the organization, especially how to coordinate diverse production skills, and integrate multiple streams of technologies" (p. 82). For Honda the collective knowledge about high revolution engines represented a core learning competence, and as Honda expanded their product line and market opportunities into lawn mowers, motorcycles, and generators they retained key learning advantages of engine production. By retaining the "quality" knowledge, Honda maintained competitive advantage over other producers (Prahalad & Hamel, 1990).

Learning processes. Discussions of learning and how learning occurs can be found not only in the strategy literature, but also in other areas of organization theory. March (1991) described two kinds of learning needed in organizations: exploitative and explorative. Exploitative learning refers to adaptive efforts to refine or improve efficiencies in production. Explorative learning looks for product innovation and development. Studies have described how each of these perspectives contributes to organizational learning (Clegg, 1999) and can be a means to improve management in the organization (McGrath, 2001). As previously noted, Huber (1991) treated organizational learning as mental processes that could be stored and retrieved when needed by the organization. Hedberg (1981) discussed processes by which an organization had to unlearn or forget information before new information could be learned.

These notions lead to a consideration of the concept of "embeddedness." Embedded is a term used to describe learning found across the industry (Sutcliffe & Huber, 1998). Embedded learning is learning incorporated in attitudes and practices that occur in the organization. Embedded learning also may result from industry expectations that might be entrenched in common educational, training, or business additions (Reger & Huff, 1993). Another way embedded learning might occur is because organizations "borrow experience" and copy practices from another firm as the result of a particular event (Reger & Huff, 1993). An example of this kind of borrowing occurred following the Tylenol scare in the 1980s when protective seals were placed on medication sold "over the counter." Embeddedness in this OT tradition is not concerned with issues such as culture or micro-interactionist perspectives. Instead embeddedness is about solving problems and acquiring skills and knowledge for production and is similar to Nonaka and Takeuchi's (1995) understanding of tacit knowledge that is something an individual knows but is not measurable because it is not easily visible or expressible.

Strategic organizational learning. Another kind of learning important to organizational theory is strategic organizational learning (SOL). SOL was selected as a distinct stream for papers submitted to the 3rd International Organizational Learning Conference (Easterby-Smith, 2000), and has grown in recognition. Several recent writers believe that SOL is a means to impact fundamental change in the organization (Crossan, Lane, & White, 1999; Kuwada, 1998; Thomas et al., 2001) because SOL is an intentionally planned process targeting organizational goals or basic assumptions in an organization. A recent model (Thomas et al., 2001) described ways in which knowledge was transferred through interactions involving a specific process using on-site reflection and consultation with an expert strategic learning team. The initial SOL process began with real-time observation of the defining event. A second step involved focused attention and data acquisition by an observation team. The third step, interpretation, involved detailed discussion and categorizing of lessons. Through a fourth step, these lessons were "disembedded" and transferred to the organization through quality control mechanisms and technology. Feedback occurs at each stage and includes those participating in the defining event, an observation team, analysts, and clients.

Complexity and the learning organization. The learning organization is another area of OL explored particularly by writers and consultants and is described briefly. I have included this section here and a similar section later in educational theory to contrast the different viewpoints.

Since Senge popularized the learning organization (Senge, 1990; Senge et al., 1999) a wide range of consultants have emerged who are interested in the learning organization. One interest in this study is how OL is shaped by the cultural context. Systems theory literature and popular writers on the learning organization illustrate aspects of the Durkheim tradition with the emphasis on culture as the key aspect for organizational learning. This perspective is interesting because it considers OL a means to achieve results by changing or altering certain conditions within the organization.

A primary focus of work on the learning organization is using learning from the organization system as a whole to enhance productivity (Senge, 1990). Senge (1990a) described OL from experience adaptive learning, and coined the term "generative" to describe the capability of an organization to learn systemically across the organization. Consultants representing literature on the learning organization often focus on how to implement learning in the organization. Literature in this area includes field books and workbooks for OL (Senge et al., 2000; Senge, Kleiner, Roberts, Ross, & Smith, 1994) and managerial guides that advise how a manager can overcome resistance to change (Belasco, 1990; Kreigel & Brandt, 1996; Oakley & Krug, 1994). A clear benefit derived from the field books and workbooks is that they are accessible not only to managers but also to persons representing different entry points in the organization. On the other hand, most management guidebooks are directed toward the manager or leader in the organization.

A criticism of the learning organization literature has come from those persons interested in complexity theory who make a case that the organization must be considered a living system in which all aspects are interrelated (Wheatley, 1992; Wheatley & Kellner-Rogers, 1996). Wheatley & Kellner-Rogers (1996b) argue that many writers assume that organizations behave as machines with replaceable parts rather than as a living system. A machine view suggests that organizations are interrelated parts and that simply changing one part of the organization will facilitate the intended goal. Understanding the organization as a living system invites learning that utilizes the experience of persons most directly impacted. Wheatley and Kellner-Rogers (1996b) suggest fewer levels of management and assume that leadership will emerge from the needs of the moment, combining people and resources that create new initiatives and organizational processes.

The impact of power on organizational learning. The problem of power and how power shapes organizational learning was apparent in the early work of Argyris (1978) who found that senior managers often blocked learning in the organization to preserve their career interests. Although organizational theory researchers such as Clegg (1999) and Boje (1991, 1995) question the assumption that organizational learning is neutral and beneficial, the field tends to ignore questions about the interests served, the kind of learning that is valued, or different ways to understand learning. Key OT writers such as Huber (1991), March (1991), Walsh (1995), Weick and Westley (1996) assume that power is neutral in its impact on organizational learning. However, because OL suggests learning is influenced through language, interpretation, group interactions, and relationships, this assumption should be examined closely. It is reasonable to include in the list of influences on organizational learning the impact and use of power.

A traditional definition of power is the ability to get someone to do what you want them to do, force him or her to act against his or her will or to do something she or he otherwise would not do (Hardy & Clegg, 1996). Methods to achieve these ends such as shared decision-making in political activities may be open to participation by different parties. However, power can also be obscured, evident in the maneuvering to include or exclude issues from decision-making. Obscured power is hidden, grounded in the social systems that suppress conflict. The use of this kind of power sustains the dominance of elite groups and reduces alternative actions by less influential groups (Hardy & Clegg, 1996).

It is important for OL researchers to keep an eye on the "Who is interested?" or "Who benefits?" to understand how some interests may benefit some people or groups in an organization at the expense of others. For example, management literature has focused attention on the power of legitimate authority (Burrell & Morgan, 1979; Nelson & Quick, 1997). As a result, opposing points of view are seen as illegitimate. The unspoken linguistic dilemma associates legitimate power with the "good guys" and illegitimate with the "bad guys" which has broad influences on issues such as leadership, charisma, and organizational goals (Hardy & Clegg, 1996). Another view that hides particular interests is the belief that *how* power is used is crucial and not power itself. This perspective implies objectivity and neutrality because power can be viewed as positive, the ability to accomplish purpose, or as negative, the ability to stop an action (Burrell & Morgan, 1979). The viewpoint of critical theory notes how the strategic direction and influence of power serves one viewpoint over another (Hardy & Clegg, 1996). By asking, "Whose or what interests are served?" the impact of power on OL may reveal how a particular action is related to gaining or sharing advantages. Management OL literature has tended to focus on improving profits and productivity. OL researchers critical of this view focus on workers' control of knowledge and access to learning opportunities.

Interests need not be defined by rigid divisions between attempts to dominate or change the status quo (Deetz, 1996), but may also embrace the goals, values, expectations, desires, and other reasons that cause a person to act in one way rather than another (Morgan, 1997). Morgan (1997) suggests three "interconnected domains" relating to organizational politics and power: task interests, career interests, and extramural (personal) interests. In any specific situation the balance a person perceives in these perspectives will change. Since these interests represent intersecting domains attempts to balance the different interests may not always be achieved and individuals may act so that only one or two of the interests are fulfilled.

In an organization, coalitions of diverse stakeholders will form according to these interests. It is possible that a dominant coalition such as the central office of the chief executive may control key areas, but other coalitions of interests may form and retain control of important areas in the organizations. Coalition building around interest groups is a means to achieve specific interests. Power can be viewed as the medium through which conflicts of interests are resolved (Morgan, 1997). In this view power represents a means to benefit everyone. In such a viewpoint, it is the distribution of power that is important. Distributed power is power that can be exercised between groups, often as a plurality, in which different groups interact to balance power. In this definition power is less something wielded over another, and instead a means to achieve different purposes and attain mutual benefits.

Since learning is impacted by the practices, encounters, capacities, and aspirations inscribed in social patterns represented by these coalitions, it is critical that there is an understanding of the differential relations of power and knowledge in organizations (Clegg, 1999). If power is contested in the organization, it follows that learning will also be contested.

Summary. Several observations can be made about the organizational theory perspective of organizational learning. The RBV of a firm suggests that non-imitable intangibles such as learning or culture are valuable and help a firm to achieve a competitive advantage. Also, because learning is valuable greater attention is given to learning processes, particularly those that hinder organizational learning. Organizational theory also recognizes that organizational learning is a means to change basic assumptions about an organization, although such strategic learning requires resources of time and money.

There are a number of difficulties with the view of OL found in organizational theory research literature. First, the view of OL found in organizational theory research seems most closely linked with the rational utilitarian view of OL described by Gherardi and Nicolini (2001) and tends to emphasize organizational learning that only serves corporate outcomes. Second, because OL in this view is strongly linked to outcomes that increase productivity or efficiency, it does not indicate the central importance of organizational learning as knowledge creation (Nonaka & Takeuchi, 1995). Ignoring how knowledge is created could cause the organization to miss aspects unique to the organization. These aspects could be essential for the actual growth and expansion of the organization (Rouse & Daellenbach, 1999). Third, by emphasizing that knowledge results in productivity, actual learning processes that foster organizational learning and help persons acquire necessary knowledge and skills are overlooked. In the past decade organizational theory literature has blossomed in business schools in Europe, the UK, and Australia/New Zealand and new sites explore sophisticated perspectives of OL in such areas as critical management studies, feminist organization studies, the new sociology of organizations and other inter-disciplinary areas. Still, a limitation of the OL research in some organizational theory is that power and its impact are too often seen as neutral and not enough attention is given to the particular interests that shape the understandings and activities of organizational learning. Since there are numerous limitations if one only considers the discussion of OL within the field of organizational theory (typically representing commentators in business and management studies), the next section explores the research in educational theory that informs the discussion.

Organizational Learning Research in Educational Theory

In contrast to organizational theorists addressing OL, theorists in adult education and human resource development tend to be more focused on human development and well being, the overall impact of learning, and particular learning processes involved in organizational learning. This section discusses some of the contributions that educational researchers have made to OL including—OL learning processes, the OL context, complexity learning—and how educational theorists critique the optimistic view of OL present in both management and learning organization literature. In this respect, educational researchers can be seen as continuing in the micro-interactionist and postmodern sociological traditions identified by Gherardi and Nicolini (2001).

Learning processes. Learning processes are the ongoing practices or conceptions about learning. One person who bridges the two worlds of education and business is Chris Argyris, the James Bryant Conant Professor of Education and Organizational Behavior in the Graduate Schools of Education and Business Administration at Harvard University. His work is important in the field of human resource development because he has described barriers inhibiting organizational learning processes, such as defensive practices that damage group processes and decision-making (Argyris, 1986, 1991). Defensive practices are not always apparent and may even be a characteristic of smart people (Argyris, 1991), such as consultants who blame the lack of client results on not adhering to the advice given or the lack of appropriate client skills rather than the consultants' abilities. Argyris has influenced educators such as Marsick and Watkins (1999) who envision new organizations for learning.

The concept of different levels of learning in organizations seems to be generally accepted by researchers (Easterby-Smith, 2000). Argyris and Schön (1978) developed the understanding of levels of OL as single loop, double loop, and deutero-learning. Single loop learning is the ability of an organization to identify and correct errors. Correcting errors for example occurs when someone realizes that they are driving an automobile too fast and decides to make a correction and slow down. Sometimes, however, the errors are created by the organization itself such as when it has incompatible organizational norms. Resolving incompatible norms was termed double loop learning, which resolves learning problems by reframing. In this case a driver may think that being alert and obeying traffic lights constitutes good driving, but reframe driving above the speed limit to keeping up with traffic and not an indication of poor driving.

Deutero-learning introduced another level of organizational learning emphasizing how an organization learned how to learn. Deutero-learning occurs as organizations inquire into previous learning contexts and evolve new understandings that aid learning across a range of situations (Argyris, 1993). Returning to the previous example, the driver realized that receiving speeding tickets was not affordable, and the new awareness not only changed driving speed but also enabled the driver to practice safe driving in all conditions.

Learning context. Educational theorists seem to stem from the micro-interactionist tradition and tend to focus on learning as contextual (Bruner, 1990; Hager, 1999), as processes that occur within occupational communities (Chaiklin & Lave, 1996; Lave & Wenger, 1991), and on the organizational design for learning (Marsick & Watkins, 1999) or workplace curriculum (Billet, 2001).

Cognitive studies tend to be the dominant view of organizational learning (Walsh, 1995), but theorists interested in situated cognition such as Brown and Duguid (1991) and Lave and Wenger (1991) have shown that collective practices shape individuals. Lave and Wenger (1991) described the critical role played by collective culture in helping persons to move from peripheral members to full participants in an organization. Such a learning process emphasized that learning occurred as persons were immersed in cultural activities and relationships. Such learning was within a community of practice. The central aspect is that learning is doing. Learning is conceptualized as participation in social interactions and practices that characterize a particular community.

Organization learning, however, is not simply participating in a community, but includes dynamics of learning and the necessary support structures for learning. Stephen Billett (2001) suggested that learning in the workplace was everyday thinking and acting, but not "just doing it." For learning to occur it was necessary for the organization to provide the necessary structure for learning. Structures included educational support such as guidance and curriculum. However, structures for learning also included the opportunity to develop capacity through new tasks. Also, because the workplace was contested, access to the necessary activities and guidance might not be available to all employees; therefore it was necessary to ensure that the necessary structures conducive for learning were present. These structures included task factors, work practice factors, and relationship factors (Billet, 1999, 2001).

C*omplexity theory*. Another useful perspective on OL advocated by commentators in education and human resource development is complexity theory, which some have contrasted with "complicated learning" that they claim permeates existing learning theory

(Davis, Sumara, & Luce-Kapler, 2000). Complicated learning is evident in a problem solving process that first breaks a problem into different parts and then attempts to fix the different parts. Davis et al. (2000) point out the ways in which the language of complicated learning represents learning as a product. Complicated learning envisions systems as a mechanical collection of parts, linear, focused on solving problems, can be figured out through the analysis of its parts, and predictable once understood. Often complicated learning is considered to be a product, something tangible that exists as a thing by itself. Common expressions in our Western language often represent complicated learning as an object such as when a learner grasps an idea, holds an opinion, tosses ideas around, or digests an idea by saying, "Let me chew on that."

A different perspective explains Davis et al. (2000) suggests that learning is complex and non-linear. Learning as complexity is holistic and, rather than a product or outcome, represents learning as an active engagement in a widening circle of relationships. Complicated learning looks at a clock and explains the clock mechanism. Complexity learning understands that a clock is embedded in a social and natural environment. Complexity learning understands that the clock represents a wide set of relationships that not only include how a day is broken into twenty-four hour segments, but also how these segments represent and interact with patterns and practices in our society. Complex learning therefore is not a product separate from the learner, but the relationship of the total body of the learner actively seeking balance in the interactions with the social world. An advantage of the concept of complex learning in OL is the acknowledgment that learning will always be entangled in a web of relationality (Davis et al., 2000). The relationality of learning is a complex process that includes the individual and the organization involved in dynamic structures supporting interactions, conversational patterns that contribute to the construction of meaning, and the collective characters engaged. Taken together all of these factors contribute to a holistic understanding of complex learning.

Power and organizational learning. Critical educational theorists bring an important critique to the OL literature by challenging the optimistic orientation of OL literature represented by organizational and system theorists. Critics have asked, "How is learning actually framed? (Livingston, 1999)" "What is the purpose of learning?" (Fenwick, 2000; Garrick & Clegg, 2000) and most important, "Who benefits most from learning activity?" (Bouchard, 1998). Rather than seeing only benefits, these researchers question aspects of organizational learning focusing on how corporate educational opportunities are decided and how the assumptions embedded in organizational learning practices impact the worker or workers.

Educational researchers from a critical theory perspective draw attention to dominant interests as well as understandings of learning (Fenwick, 1998; Garrick & Clegg, 2000; Howell, Carter, & Schied, 2002; Schied, Carter, Preston, & Howell, 1998), including how informal learning is recognized and valued (Livingston, 1999), and how existing learning is used (Livingston, 1999). Educational researchers are not enamored with the profit-centered aspect of organizational learning and point out how managers rather than workers decide what workers should learn, a practice that sub-ordinates workers to needs identified by management that may or may not assist the development of the worker (Fenwick, 2000; Howell et al., 2002; Schied et al., 1998)

Educators have focused on macro and micro perspectives of organizational learning. A macro perspective investigates how political, labor, corporate, and state interests work to foster certain kinds of learning. Noting that organizational learning originates in the economic context and perspective of human capital theory, critical writers have asked how hegemony may influence worker awareness and encourage a worker to be politically passive (Coffield, 2002). Coffield (2002) questions practices of organizational learning that emphasize individual responsibility while ignoring structural aspects of an industry that promotes downsizing.

Researchers interested in the micro political processes note that the primary responsibility for learning is often devolved onto the individual learner (Coffield, 2002; Fenwick, 2000; Kincheloe, 1999). Although it may seem fair that the individual assume responsibility for learning since he or she will most directly benefit from any gains attributed to learning, these authors note that devolution onto individuals often deflects analysis away from systemic issues limiting an organization's production and that access to learning opportunities is not a level field. For example, individuals will vary as to the extent of training or kinds of informal work-based learning opportunities that are afforded to them (Billet, 2001; Livingston, 1999). Other issues such as gendered work conditions have been identified as factors inhibiting women from gaining certain organizationally-valued knowledge, such as technical or managerial skills (Moffat, 1997; Ntiri, 2001). Although it is generally assumed that lifelong learning is valuable, educational theorists have explored how the practices and stresses of life long learning negatively impact the ability of the worker to learn (Reich, 2000).

Not surprisingly, educational researchers also ask questions about the overall impact of learning. These writers point out that the type of knowledge is often instrumental (Fenwick, 1998; Schied et al., 1998). OL may limit, not only the development of the individual, but also the ability of the individual to think holistically about one's work or use critical reflective skills to improve quality or efficiencies on the job (Schied et al., 1998), or indeed, to think critically about the structures and conditions of the labor process.

Educators concerned about the workplace argue that OL can be improved by application of educational practices to organizational learning (Tight, 2000) and by attending to the nature of the work place (Billet, 2001; Marsick & Watkins, 1999). For example Kincheloe (1999) suggests ten principles for fundamental improvement in work place democracy and the nature of good work. The critiques offered by these researchers are useful in revealing the darker side of organizational learning and provide a perspective on organizational learning that may help bridge educational institutions and workplaces, including private, public, and not-for-profit organizations. A practice that holds promise for sharing power in the workplace setting is the concept of democratic space (Coopey & Burgoyne, 2000). Democratic space provides a setting to engage in dialogue and decision-making. Such social practices can be located in current practices, encounters, and capacities already occurring in organizations. Coopey (2000) suggests fostering democratic learning communities in the workplace, a practice that, if coupled with principles of good work (Kincheloe, 1999), could create learning environments that make the workplace representative of democratic expression and cooperation.

Summary. Educational researchers have helped ground the understanding of OL in a number of ways. First, educational researchers have underscored that the collective organization is composed of ongoing practices and relationships. Second, complexity researchers have shown that learning is not simply a linear process, but involves dynamic relationships that widen out rather than limit. Educational researchers, such as Kincheloe (1999), also have shown that *how* power is understood is not neutral, but plays a critical role and influence on organizational learning.

A Conceptual Framework for OL as Knowledge Creating Activity

Drawing on these two research areas, in this section I identify and explain a conceptual framework for OL comprised of three elements. Each is briefly noted here and more fully explained in the following sub-sections.

The first element underscores OL as new information. Organizational theorists have tended to emphasize new information as individual cognition often learned through trial and experiences. Recent organizational theorists emphasize new information utilizing systems thinking, but still tend to view this information through the understanding of individual cognition. Educational researchers balance this perspective noting that the particular practices of the collective are crucial in acquiring and using new information. In much of the OL literature the emphasis on cognitive knowledge and productivity have underemphasized new learning related to these collective practices.

The second element suggests that organizational learning as new information is somehow linked with the ongoing interrelationships in the organization. In this paper I draw from the actor network literature to argue that these ongoing interrelationships are networks that become linked and stabilized through the work of intermediaries.

The third element of this framework is the movement of OL as a continuous cycle of negotiation. In developing this element I draw on the understanding of networks and the conception of organizational learning as a web of relationality. Actor network theory suggests that movement will be involved because of a translation process that occurs as people interact with technology. However, the translation process is not necessarily linear. I draw from the concept of the web of relationality to underscore that the movement of OL may not be linear and instead may move through an organization in a number of different ways.

Commentators such as Tight (2000), Brown and Duguid (1991), or Senge (2000) have shown that creating successful learning environments is a concern in business, government, and non-profit sectors and involves work teams rather than individuals. An implication of OL research in both educational and organizational theory is that learning was more than an individual act, and involved interactions within groups. One result of such interactions moved the decision-making process closer to the front line of product development. As a result, individual managers do not have all of the necessary information needed for decision-making and must rely on group processes. The limited knowledge of managers has been recognized since Simon's work during the 1940s and 1950s introduced the term "bounded rationality" to describe the way in which managers coped with limited information (Morgan, 1997). As a result, strategic decisions and complex organizations often are shaped by top management teams rather than by individuals (Maier, Prange, & Rosenteil, 2001). Because of these trends it is important to recognize that although the individual is indispensable for learning, the individual viewpoint is insufficient to understand organizational learning (Maier et al., 2001). The perspective required is one that includes individuals, groups, tools, and the processes that bind the organization as a whole.

In my study there are links to both the rational utilitarian tradition and the micro-interactionist tradition outlined by Gherardi and Nicolini (2001). From the rational utilitarian tradition I make use of organizational theorists such as Nonaka and Takeuchi (1995) and strategic organizational learning researchers such as Kuwada (1998) and Thomas et al. (2001) and focus attention on one aspect of OL as new knowledge that is created or recognized. From the micro-interactionist tradition I use the emerging work of a translation model of organizational learning (Gherardi & Nicolini, 2000; Gherardi & Nicolini, 2002) to describe two additional aspects of OL networks and the movement of OL. Also, this study borrows from researchers such as Callon (1986, 1990) and Latour (1992) in the recognition that both humans and non-humans can participate in a network. The movement of new knowledge in an organization is suggested in the notion of translation expressed by these writers. Also, I draw the idea of circulation from the Gherardi and Nicolini's study showing how the understanding of safety circulated at a construction site. Drawing from these works and the previous discussions of OL by organizational and educational theorists I have come to believe that organizational learning involves three elements: new knowledge, networks, and a cycles of negotiation. Each of these three elements and how they link with the research literature is discussed in the following sub-sections.

Element #1: New knowledge from within the organization. Nonaka and Takeuchi (1995) suggested that knowledge was created by individuals and crystallized as a part of the knowledge network of an organization. Nonaka and Takeuchi (1995) locate knowledge creation in the individual and the transfer of tacit knowledge through a hierarchy of organizational phases. Tacit knowledge is personal, context-specific, includes cognitive and technical elements, and is difficult to formalize and communicate. However, Crossan criticized Nonaka and Takeuchi (1995), noting that they assumed individual knowledge was cognitive rather than socially constructed and they did not relate their work to OL literature (Crossan, 1996).

My assumptions about OL differ from those of Nonaka and Takeuchi in the understanding both of individual cognition and of how new knowledge travels in the organization. Whereas Nonaka and Takeuchi focus on individual cognition, my work stems from the micro-interactionist tradition outlined by Gherardi and Nicolini (2001) and draws on practice-based understandings of learning suggested by Lave and Wenger (1991), Cook and Yanow (1993), as well as the concepts of relationality and complexity learning of Davis et al. (2000). These writers focus on the situated community to understand and describe learning. By choosing to focus on a situated community it is possible to examine the impact on collective learning in such processes as group interactions, peer relationships, and an organization's culture.

As well, I do not agree with Nonaka and Takeuchi's (1995) understanding of networks. Nonaka and Takeuchi (1995) suggest a seventh and final step for a knowledge creating company to disseminate new knowledge, that is, construct a knowledge network with the outside world. Nonaka and Takeuchi (1995) believe that the knowledge network is a social network emphasizing personal relationships and two-way interaction with clients. These social networks stress the relationship of innovation and product distribution, but aspects of organizational learning such as culture, group processes, or the relationship with technology and how ideas circulate are not addressed. Another means to explain OL and innovation of new ideas can be drawn from actor-network theory.

Element #2: OL linked through knowledge networks. The concept of a network describes the structure and actions of an actor-world. In a network a translation process occurs as an interrelated set of entities are successfully translated or aligned by an actor. The translation is successful when an actor is replaced and the new actor becomes able to speak or act for or with the support of all interrelated entities (Callon et al., 1985). A translation process can be complex, but at its simplest form involves at least three entities that interact. The result of the interaction is that one of the entities is replaced. Latour (1991) described a simple example of a translation process. He explained how a hotel manager influenced compliance with a polite request to return room keys to the front desk by adding a heavy weight to the room key. The sign asking guests politely to return the key is replaced, translated into a heavy weight that causes guests to readily return the key rather than carry the heavy weight.

According to Callon (1986) the translation process is explained through four moments of translation: problematization, interessement, enrolment, and mobilization. Problematization not only defines an issue, but also describes the roles, wants, and members of a network. However, defining the issue or the entities does not make a network because these members must also become interested. Callon (1986) used the term interessement to refer to the second moment of a network in which an entity becomes interested or attracted to a specific problem. A triangular pattern is involved and interessement occurs as one entity attracts a second by coming between that entity and a third effectively replacing it. Enrolment is the distribution of roles in a network. Roles, however, are not predetermined nor are they readily imposed. Instead, Callon (1986) suggested that enrolment involved multilateral negotiations, trials of strength, and even tricks that enable attraction to succeed. Enrolment indicates willingness but also requires additional support through a fourth moment, mobilization. Mobilization refers to the successful establishment of alliances that support the network.

I draw from these understandings of network to show how organizational learning involves networks. Many current practices in business, government, and non-profit sectors involve work teams rather than individuals. Such a new practice implies that learning is more than an individual act, and involves interactions within groups. These interactions seem to naturally involve networks because these are the heterogeneous processes linking individuals, groups, and the organization as a whole.

Callon (1991) explains that vital to the creation of a network are intermediaries. Intermediaries are those things which link and enable information to travel in the organization and include not only the role that humans play as agents, but also how artifacts, texts, or the varied manifestations of money shape OL (Callon, 1991). A network may include human and non-human components. Human actions are both shaped by context and shape the context in which they occur (Chaiklin & Lave, 1996). In turn, non-human components ranging from legislative acts and government decisions, technical equipment and software, as well as access to decision-makers and resources in an organization become active parts of a network. Several characteristics describe intermediaries. An intermediary is not a neutral actor responsible for mediating different interests. Nor is the intermediary like a catalyst that is necessary but unaffected by the reaction. An intermediary both shapes and is shaped by the interaction. For example, a safety practice may be expressed as a written code such as a regulation requiring that safety belts be worn while driving as well as an artifact such as a mechanism that makes it impossible to sit in a car without a seat belt attached. An intermediary embodies as well as orders actions; they are the visible result as well as a representation of the energy and effort needed for OL to circulate (Gherardi & Nicolini, 2000).

An OL question that can be raised in Latour's example of the weighted key is "How did the hotel manager learn to add the weight?" Latour seemed to assume that the learning process was an innovation supported through a network alliance of three relationships: the hotel manager, an innovator, and the metal weight. However, this explanation does not explicate the content, processes, or direction of OL. Instead he seems to simply assume the innovation. Since the focus of this study is organizational learning, there are two implications that may be gained by from Latour's illustration. First, by asking how the hotel manager learned to add a weight to the key, the focus locates learning in the relationships that occur in the work setting. Second, by connecting learning and the means of expression used to confirm learning, attention is shifted to the networks that are involved in learning.

Element #3: OL as a continuous cycle of negotiation. A third aspect necessary in organizational learning is the cycle of continuous negotiation. Gherardi and Nicolini's study of safety shows how the idea of safety circulated between different groups at a construction site. Also, the concept of translation assumes movement such as when one entity is replaced by another. Rather than assume that this movement is a singular event it seems reasonable to assume that there is an ongoing back and forth aspect of interaction that reinforces organizational learning. Intermediaries negotiate learning through a continuous cycle of negotiation (Gherardi & Nicolini, 2000). Negotiation means that at least two different parties have conferred together about a third entity and have reached an agreement. In this way negotiation and the understanding of networks are similar. A cycle of negotiation represents interactions that are situated in ongoing work settings and the subsequent actions. As a result the OL emphasis is not on cognitive learning that is stored, but attends to movement of OL.

Critical to the cycle of negotiation is how OL acquires energy. One view suggests that movement occurs because of the authority that propels it as, for example, the authority to enforce acceptance. The translation model suggests that movement is propelled by the energy which occurs in interactions that empower, negotiate, resist, hide, embody, or otherwise act on OL so that it is a continuous process emerging, sustaining, revising, and reforming. The engagement moves in an ever widening circle of relationships or what has been described as a web of relationality (Davis et al., 2000). In this web an idea can be reshaped and presented in a similar but new way in the organization.

Summary. This chapter has suggested that although the field of organizational learning is diverse, a robust understanding of organizational learning is possible. Rather than trial and error learning that is unplanned and dependent upon happenstance, organizational learning can be a strategic learning process that includes all members of the organization. Such a strategic learning process focuses attention onto the spaces in organizational life where learning occurs in interactions in the community. These interactions acknowledge new information, and use this information to improve the overall functioning of the organization. Although there is a tendency to think that improving the overall functioning of an organization is a matter of increasing income or saving costs, it is equally important to invest in relationships. One reason is that new information is often not located in top managers, but found in the everyday actions of the organization. As a result continuity and links in these relationships is crucial in organizational learning. Rather than linking front line workers and managers by a top down hierarchal organizational model, organizations can recognize that these different groups are linked in ever widening webs of relationality.

CHAPTER THREE

OBSERVING ORGANIZATIONAL LEARNING

This study examined the conditions and processes fostering organizational learning in a high reliability organization, the Centre for Fire and Emergency Training (CFET). I observed naturally occurring interactions between individuals and groups in the Operations Department of the CFET, observed weekly meetings of the Network Bridging Team (NBT), interviewed twenty staff drawn from multiple levels of the organization, and analyzed archival documents related to implementing recent innovations.

The view of OL as individual and cognitive is problematic for research in OL because it is difficult to investigate empirically. Several factors contribute to this difficulty. First, it is difficult to observe actual learning events apart from a controlled laboratory setting. Second, measuring learning that occurs requires measurement of the subjective meaning attached to learning, which varies among individuals and is difficult to quantify. Even attempts to measure learning competencies recognize the need to include both the meaning attached to learning as well as the context (Sandberg, 2000). Finally, learning which is understood in a cognitive framework must recognize the impact group processes, interactions, and social relations have on learning.

The research design for this study is presented in the subsequent sections. First, I describe why organizational culture is important to a research study of organizational learning and then I explain why I chose a case study approach. A brief context of the study is provided. Additional sub-sections explain how data were collected and analyzed. Finally this chapter describes actions taken to assure believability, the limits of a case study, and the ethical practices used in the study. Since organizational culture is an important aspect of this study it is the initial point of methodological discussion.

Role of Organizational Culture in Organizational Learning

The approach I have chosen in this study is linked to the micro-interactionist tradition of Gherardi and Nicolini (2001) rather than the broad non-rational Durkheimian tradition. The micro-interactionist tradition extends the non-rational aspects of cultural influence and focuses instead on how individuals shape reality within organizational communities. Several authors linked to the micro-interactionist tradition have suggested that one means to further explore organizational learning is to study the cultural context of organizational learning (Cook & Yanow, 1993; Miner & Mezia, 1996; Rouse & Daellenbach, 1999; Weick & Westley, 1996). The advantage of linking the micro-interactionist perspective with culture and organizational learning is that I was able to explore a comprehensive understanding of learning grounded in situated practices.

Exploring this relationship is appropriate because culture and learning highlight the relational aspects of language, artifacts, and action routines (Weick & Westley, 1996). By focusing on these relational aspects it is possible to observe actual relationships involved in learning. Gherardi and Nicolini's (2001) translation model showed that different understandings of safety circulated in a construction site. This study was similarly interested in the actual relationships in which the translation of learning occurred. Three relational aspects were initially identified as a point of inquiry: language, artifacts and action routines. A brief explanation of these three aspects follows.

Language. Language is important in face-to-face communication and printed communication. Language is a means to transfer information across an organization. One example of the importance of language is how the choice of metaphors to describe a product can impact the ability of an organization to understand, interpret, plan, and achieve strategic goals (Crossan et al., 1999; Morgan, 1997).

Analyzing language is concerned with what is communicated, how communication occurs, and the different understandings and meanings that exist. Organizational learning is not only about the content. Organizational learning is impacted by who is communicating, where the communication is occurring, what different meanings about learning occur in the organization, the kind of information that is not discussed, as well as what others might have said that influence organizational learning (Boje, 2001).

Artifacts. Artifacts according to Weick and Wesley (1996) were tangible symbols such as a logo or product that were also indicative of organizational identity and pull toward innovation. In the case of the Powell flute company studied by Cook and Yanow (1993) the production of a Powell flute designed to the Cooper scale was an example of an artifact that represented innovation. In this study artifacts were one of the initial points of observation, but during the study were subsumed under the understanding of intermediaries. Intermediaries seemed to be more comprehensive and also seemed to provide a better explanation of the movement of organizational learning. The movement occurred in interactions of individuals, groups, and departments. Such interactions were situated in a specific problem, such as when an alcoholic learns a first step of powerlessness (Lave & Wenger, 1991). Interactions also involved sharing of tacit knowledge such as the flute makers who measured the tightness of the valve pad mechanism by how it felt rather than by a specific measurement (Cook & Yanow, 1993).

Action routines. Action routines were another means to observe organizational learning. Action routines distinguish organizational learning from individual learning (Crossan et al., 1999). In a routine, individual learning occurs but an individual then shares the information with others. The learning may assist individuals, but, as routines are established, it becomes organizational learning.

At the beginning of this study I believed that I would be able to observe actual processes in which learning occurred. To some extent these processes were identified and are presented in the next two chapters. What was also evident was that the daily routines, such as the morning coffee hour, involved multiple relationships and interactions. The conversations that occurred in the routines I observed also seemed to coalesce around different people, issues, or objects. The means by which these multiple interactions came together and the subsequent actions that followed became a source of further discussion because of the circulation of learning and of the formation of networks that I observed.

In conclusion, investigating OL empirically is a problematic opportunity. Problematic because the tendency to view learning as individual and cognitive focuses attention on individual not organizational actions; but an opportunity because it is possible to identify the impact that social relations have on the ability of the organization to learn. Articles by Crossan (1999) and Thomas (2001) suggest that research in organizational learning attend to actual processes of organizational learning. A means to investigate actual OL processes and provide a fine-grained picture of organizational learning is a case study.

A Case Study Approach

The study used a case study approach to examine actual processes by which a high-reliability organization incorporated and disseminated innovations. One characteristic of high-reliability organizations (HROs), which include nuclear power plants, nuclear aircraft carriers, wild land fire fighters or air traffic controllers, is that they are able to achieve extraordinary safety records and productivity standards (Weick & Sutcliffe, 2001). Organizations such as the CFET operate at strict levels of preparedness, consistency, and regulation because mistakes can lead to catastrophic loss of life. Therefore, fostering organizational learning is a high priority. Although the focus of this study was a HRO, the processes of organizational learning could be applied to any organization concerned with safety, productivity, and high quality.

A case study focuses on the particularity and complexity of a single case (Stake, 1995) to understand an activity and its significance. Case studies can be intrinsic or instrumental. An intrinsic case study explicates a single case. For example, to evaluate a particular program an intrinsic case study would focus on knowing as much as possible about the particular case. An instrumental case study, examines a particular case to cast light onto something other than the case (Stake, 1995). For example, a medical doctor might use the case of a geriatric diabetic to illustrate the complications of the late stages of diabetes. This doctoral study was an instrumental study that examined the CFET to shed light on the broader issues of organizational learning. In this study these issues included identifying how organizational learning was fostered in the organization, understanding the conditions and process that fostered innovation, and understanding how organizational learning traveled through the organization.

A case study method was appropriate as it provided a means to study an organization in depth as well as the flexibility to respond to new or emerging processes in the organization. The in depth view also illustrated the complexity of these OL processes. Using a case study design enables observation of individual behavior and the context of the experience. Analysis of the case includes details of the organization and how decisions are made. The case study describes the conditions that enable an organization to disseminate innovative learning. A second reason for using a case study was that it provided flexibility that allowed me to respond to individual and organizational conceptualizations of innovative learning in a high reliability organization. Finally, a case study approach provided the opportunity for my research to consider outcomes of critical learning incidents from differing interpretations (Boje, 1995).

Recalling the entry difficulties in a longitudinal study of radiologists (Barley, 1990), I anticipated some problems related to my own study of the CFET. Although I was optimistic that I could obtain entry to the organization, I did not assume that it would be easy to gain trust and support from all levels of the organization. In this endeavor, my plan was to have several means available to present background information to the organization including a one-page description of the research explaining the purpose of the study and how confidentiality was maintained, recruitment of sponsors who were trusted members representing all levels in the organization, as well as using each personal encounter as an opportunity to gain trust and cooperation for this study.

An Ethnographic Portrait

I use the term ethnographic portrait to describe how I represent a portion of life at CFET and the relationship of the observed activities and relationships with organizational learning. My study was not an ethnography because I did not have close and sustained interaction with people for over the course of a year (Tedlock, 2000). Nevertheless the study was ethnographic in nature because I sought to understand these relationships and activities in a "fuller, more meaningful context" (Tedlock, 2000, p. 455).

My research was conducted over a period of ten months in which the initial three months involved developing the proposal, obtaining permission to conduct the study, and securing the required ethical clearance. My actual on site involvement was twenty-eight days spread over four months in the field. Also, this research included three additional months of reflection away from the field and a return visit to the site to visit during which I presented information about my observations to a meeting of the CFET staff.

In adopting this approach, an ethnographic portrait, my work is similar to other studies that have provided ethnographic portraits to unravel the many meanings of the different activities and themes found at the Western Wall in Jerusalem (Storper-Perez & Goldberg, 1994) or to understand the different development negotiations required of Yemini American high school girls (Sarroub, 2001). My work is also similar to Czarniawska: although she spent fourteen months on her study of public institutions only four months were in the field (Czarniawska, 1998).

Context of the Study

Founded in 1959 as a government program providing training for municipal fire fighters, the Centre for Fire and Emergency Training (CFET) helped municipalities learn modern techniques for fire fighting and prevention. For forty years the fire fighting centre functioned in Firetown, a city of 4400 residents in Western Canada, as an autonomous training centre providing on site training and education. On site training occurs in a twenty-acre simulation theatre that is a setting for training in different types of fire situations: residential (rescue in smoke conditions), industrial (propane gas), and skills (calculating pump pressure and accuracy with the fire hose). In 1998 the CFET was incorporated as a subsidiary-corporation of Firetown Community College (FCC). It was expected to be a self-funding organization.

The study focused on the Centre for Fire and Emergency Training Network Bridging Team (NBT) and individual and group interactions in the Operations Department. The NBT was made up of senior management leaders of the organization, and was responsible for coordination of information between departments as well as strategic planning. The Operations department was responsible for risk management, site based education, educational seminars, government and industry liaison programs, as well as fire and emergency training. Also included in the Operation department were student courses as well as additional training required for established officers.

Success of the plan for self-sufficiency hinged on CFET's ability to learn how to incorporate emergency and fire services designed for off-site education as well as bridge the different cultural issues of fire fighting and emergency services training (EST). Historically, on site programs provided basic training for entry level fire fighters, continuing education seminars to help trained personnel meet changing responsibilities of municipal fire fighting, and a certified advanced course in fire officer training. The on site educational programs also trained emergency personnel, bridging traditional fire fighting with emergency training. This change had important implications for such cultural issues as the fire fighter's identity and it impacted the every day routines. EST students for example were required to wear uniforms during class, but students registered in the basic fire fighting courses did not wear uniforms.

The challenge for the centre was to develop the capacity to expand beyond the traditional on site education to provide off site educational and consulting services. These external services actively expanded to meet the emergency service needs of clients. Rather than being developed and driven by the faculty, these services were often at the initiative of the client. Thus the organization was also learning how to tailor programs to the individual customer needs. To develop this capacity the organization strived to become a learning organization capable of meeting a wide variety of customer needs such as disaster plan reviews, emergency service audits, consultation regarding emergency services legal issues, environmental impact assessments, human resource planning, industrial safety and risk management analysis, pre-fire plans, procedures, and training program design.

Recently CFET completed a three-year period of self-study and planning. During this time they developed a vision of the new organizational structure and the mission of the organization. The Board of Directors approved a three-year business strategy in early 2002.

Study Participants

This study interviewed twenty CFET community members: four of the five senior management, one executive assistant, all five team leaders, four instructors, and six staff members of different departments. Eleven of the interviews were with men and nine were with women. Following is a description of the participants and a chart summarizing the demographics of the study participants. I have not identified these persons to protect confidentiality. However, when referencing individual quotations I have provided pseudonyms and descriptive materials where it will not reveal individual identities. A chart is included summarizing the general characteristics of the sample. In a subsequent section I discuss details about how I chose these persons.

Because one group I observed was the network bridging team I interviewed four of the five senior managers at CFET. The CEO had been and instructor at CFET before becoming the organization's CEO in 1994. Prior to being an instructor at CFET he worked in the industrial sector. The CEO recently earned an MBA and used CFET as the focus of his thesis. The vice-president was recently hired from the industrial sector and was responsible for new business development. The Director of Curriculum has a Ph.D. in mining engineering and has been with the centre for over thirteen years. His responsibilities included assuring that the curriculum met accreditation standards and recently overseeing the curriculum revisions. Since the CFET began its relationship with the community college, he has represented the fire fighting centre at the FCC's Deans Council. The head of operations was hired in May of 2002. This job most closely resembles a Chief Operating Officer, and was responsible for overseeing all of the on-site operations. The executive assistant to the CEO has been with the CFET for five years and was previously employed by the community college as an executive assistant.

Because I wanted to explore OL across all of the organization I also interviewed the team leaders of each department. The marketing team leader, was one of the first women to become a CFET instructor, and has been employed at the centre twelve years. In 1997 she became responsible for Marketing. That department was reorganized and moved to Business Development when the management network was begun. The financial team leader was employed previously by the FCC and began work with the CFET in 2001. Another team leader I interviewed oversaw the work of the technicians. During the past eight years the technicians expanded from a one-person department to ten full time staff. I also interviewed the Registrar who was the team leader for curriculum development. She began her work at the centre as a student intern, and was the longest tenured employee, twenty-three years. The fifth team leader was an instructor and the team leader of the instructors. He had taught at the fire fighting centre for twenty years.

In addition to these persons who I interviewed because of their role I also selected other persons to interview. I interviewed four instructors, three men and one woman, as well as six staff members. The instructors' tenure at the school ranged from three to eight years and involved special areas such as the emergency training service program (EST), the fire fighting basic courses, emergency preparedness, and risk management. One of the instructors was a woman and the only aboriginal on the faculty. At the time of the interview she was heading up a new business development that focused on risk management training. I interviewed six staff persons were also interviewed representing Information Technology, Accounts Payable, Marketing, Curriculum Design, Administrative Support, and a technician responsible for Sustainability. Their experience at CFET ranged from three to seventeen years. Interview groups are listed below.

	M	F	Tenure	Full time	Part time
Senior Management	4	1**	1- 13 years	5	
Team Leaders	2	3	3-23 years	5	
Instructors	3	1*	3-20 years	4	
Staff	2	4	3-17	6	1
Total	11	9	1-23 years	19	1

*serving in an administrative role; ** Exec. Assistant; TL= Team Leader; I = Instructor; SM = Senior Management; S = Staff

Data Collection Methods

The study collected data using observation, semi-structured interviews, and archival analysis of organizational documents.

Observation methods. This case study observed strategic organizational learning situations as one means to observe the process of organizational learning. Strategic organizational learning situations are sites and situations created in response to a change in the organization, or represent ways in which the organization has made or is seeking to make significant improvement in either communication or efficiency.

Observation also provided a means to observe group interactions reinforcing organizational learning. I observed ongoing scheduled activities with the NBT and the Operations Department. Observation of group activities is an important communication link by which information is transferred between the individual and groups in the organization. Groups do not intuit, but receive individual intuitions and further interpret and integrate this information, and it eventually becomes institutionalized as organizational learning (Crossan et al., 1999).

Observation is an important means to observe socio-cultural attitudes and communication patterns. Observation explored the conditions in which interpretations were made by individuals and groups within the organization. Group interactions are significant for making sense of collective acts because groups discuss, explore, have conflict, debate, and form conclusions.

I was able to conduct observation in naturally occurring organizational learning settings at the CFET campus from September 2002 until January 2003. In addition, I met stakeholders of the organization while attending two advisory meetings held off site in nearby metropolitan areas. Also, I attended a presentation by the organization at an annual municipal association meeting and a daylong workshop on emergency services planned and developed by CFET. While on site I observed informal gatherings during coffee, regularly scheduled team meetings, as well as work routines. The campus site does not provide dormitory facilities so overnight observation of students was not a possibility. However, I did spend ten nights at a local motel. During one of the evenings I attended a social function, a Battle of the Badges hockey game, which featured the CFET hockey team playing the local fire department.

I was able to observe a number of different situations within the organization where learning occurred. For example, learning occurred in a variety of settings such as conversations during coffee breaks, pre-training sessions, or other work settings. In addition, I attended regularly scheduled team meetings, training events, and planning sessions which provided the opportunity to observe learning processes of the organization. The flexibility of a case study enabled me to attend unanticipated events that emerged during the research process. These events included sharing pizza with staff before an evening class, attending off site meetings of the advisory groups, as well as participating in a workshop on emergency and disaster planning.

As an observer I focused on closely watching and describing the site, events, and activities, and social interactions to gather as complete a picture as possible of the relational nature of organizational learning. Of interest to me was the language used by members, the composition of different groups, and the different events that impact organizational learning. As previously noted, language has significant consequences that impact later strategic decisions. The research design examined the language, issues, and relationships that were involved in the dynamic process of organizational learning.

Organizational learning also involved group level activities such as shared understandings, mutual adjustments, interactive systems, and organizational level activities such as routines, diagnostic systems, and rules and procedures. As an observer I participated in such activities as group training workshops, committee reviews, and impromptu activities in which individuals and groups shared information.

Interview sample. A number of options for interviewing samples guided my selection of interviews. I chose to have a combination that was able to include both intensity and variation (Patton, 2002). An intensity sample provides information rich cases that manifest the phenomenon of intensity (but not the extreme ends) (Patton, 2002). I concluded that it was important to select persons from each of the different work areas because I was interested in gathering information about actual work practices in the organization.

Maximum variation was achieved by picking a wide range of participants to obtain a variation of dimensions of interest. This practice documented unique or diverse variations that emerged in adapting to different conditions. Also this practice identified important common patterns that cut across variations. It seemed important to select persons who were able to speak to the changes in the organization.

Because I was interested in recent critical learning events in the organization I decided to select persons who had three years experience with the organization. This was fairly easily accomplished because, as I met persons in the organization, they frequently shared without my asking how long they had been with CFET. Also because some of the persons interviewed held positions recently added to the organization, the interviews did include two persons with less than three years experience with the organization.

The snowball sampling practice was a means to expand the initial selection I made by asking others who they thought should also be interviewed. This practice helped to identify persons beyond my initial observations or biases (Patton, 2002).

Semi-structured interviews. I used semi-structured interviews to explore the conditions fostering organizational learning. I followed a semi-structured interview format designed to allow individuals to engage in conversation about their experience related to different aspects of organizational learning. Mishler (1986) noted the critical distinction between an interview viewed as talk and behavior versus an interview understood as a relationship between discourse and meaning. It was important to understand not only the content of the learning process, but the details of the social setting, interactions, and meanings attached. I accomplished this through several steps.

The interviews followed a conversation form that used open-ended questions. Additional information was gathered through follow up statements that explored internal perceptions about the meaning of the events as well as inquiring about the relationships to other groups and settings. Open-ended questions in highly regarded surveys of attitudes, motives, and values reveal relatively high levels of complexity in intention and wording In addition information was revealed regarding how learning was shared in such issues as problem solving, decision-making, leadership, membership, and commitment.

The conversations reached in-depth levels of conversation in which a respondent revealed personally significant information. To achieve this I drew on my clinical background in interviewing and assessment and used techniques such as summary statements and problem identification statements that provided the participant with opportunities to explain further details, such as emotions and individual meanings, that might not have been included in the initial statement. By engaging with persons in a sharing of summary and clarification, it was possible to have in-depth conversations with respondents. These conversations explored the significance of the learning for the individual, as well as the individual's perception of the significance of a particular learning event for the organization.

By using a semi-structured interview process and detailed follow up questions it was possible to enable participants to identify the relevant learning behaviours and the consequences of these behaviours on groups and the organization (Argyris, 1993). The interviews were tape recorded and fully transcribed. One difficulty in the transcription process is that some features of speech are included but others are excluded. For example, verbatim accounts may not note the rapid linguistic changes in pitch, stress, or volume, nor nonverbal gestures, expressions, or body movements. I supplemented the verbatim accounts by personal notes taken during the interview identifying non-verbal cues and other observations. Early in the proposal development I decided not to use video recording of the interviews so that confidentiality could be maintained.

A transcriber prepared verbatim transcripts of the interviews. Transcriptions of the interviews were shared with each person confidentially. The transcriptions were analyzed examining the content, structure, language, meanings ascribed to experience, and embedded organizational discourses to provide a thick description of individual and organizational learning processes (Riessman, 1993). Recent research in organizational learning has called for inquiry exploring these dimensions of organizational learning (Easterby-Smith, 2000).

Conducting an interview was not a simple matter. Interviewing required having physical access to the setting and the skills to understand and discover the individual respondent's meanings. Personal attributes are necessary to establish trust and rapport with a range of individuals in an organization (Fontana & Freer, 1994). I anticipated that one interview problem would be achieving camaraderie, the perception that you are trustworthy based on an active personal exchange that an observer might experience. In fact no resistance was expressed to interviewing and no one refused to be interviewed, although one person canceled an interview because of a change in his teaching schedule. Most persons were curious about why I wanted to study their organization and assisted me by taking time away from work to conduct mini interviews throughout my visits.

Archival research. To gain insight into the institutionalized routines that represented organizational learning I conducted archival research by studying relevant organizational documents. These documents included a 2002 Director's Report outlining the program vision of the organization, the business plan and strategies 2003-2006, and the network protocols approved by the Board of Directors to guide cultural change.

In addition, I was able to identify documents such as policy and procedure manuals, bulletin board announcements, and sign up lists that provided a context of the organization as a whole. These kind of documents may be analysed depending on availability and relevance (Yin, 1984), are an integral part of other systems and structures in the organization (Forster, 1994), and represented institutionalized forms of organizational learning (Crossan et al., 1999).

Second, additional information such as bulletin board announcements and guidelines for leading community meetings were identified during the process of semi-structured interviews or observation. Consultation regarding additional information was sought with the liaison sponsor.

Data Analysis and Interpretation

This study was similar to the ethnographic approaches used to understand situated learning in communities of practice (Lave & Wenger, 1991). I anticipated that organizational learning was a process shaped by linguistic patterns, personal identity, and cultural systems that are aspects of socially constructed learning. One means of analysis was comparing different perspectives of a learning event, which enabled me to compare and contrast the different responses made by individuals drawn from multiple levels of the organization. Similarities were identified as standard accounts in which multiple levels agreed as to the content and meaning of a learning event. Differences that occurred were noted. Gaps between the different levels of the organization were a source of knowledge about how information was diffused, or not, across the organization (Langley, 1999). By comparing the similarities and differences of the content of these interviews it was possible to identify common critical learning incidents and to gain insight into the conditions that fostered significant learning in the organization. The following steps were followed in analyzing and interpreting data.

Step one: Coding. In this study I used coding as a means to categorize data. Data included taped transcripts of interviews, notes made by the researcher during observations, as well as information available from organizational documents. Coding is a data management tool used to identify large amounts of data, to recognize key data areas or questions, and to generate initial thoughts as to what the data means (Crabtree & Miller, 1992). Categories grouped together create a codebook that serve as a template for organizing material. Three approaches have been used to organize data: a priori groupings based on a review of literature, post priori review drawn from the information gathered during the research project, and a middle approach which begins with codes based on the available literature and expands by adding data that emerges during the research (Crabtree & Miller, 1992).

I used a middle ground approach that first identified lower level categories. Lower level categories were descriptive and included codes identifying demographic information such as gender or title in the organization. Lower level codes also used a priori codes or emergent code words used by the participants. A priori codes that were relevant to this study included trial and error learning, individual process, group process, skills, and routines. Initially, coding casts a wide net to identify OL processes and events. I anticipated that the initial coding would result in a large number of categories. Using a means of clustering (King, 1994) I collapsed these codes into higher order categories that include relationships, key words, questions, patterns, sequences, and other categorizations that could be applicable (e.g., ways of being esteemed; how to look responsible, etc.) (Bogdewic, 1992). Once the research information was clustered I analyzed the data to select different themes. This process of coding organized segments of similar or related text and enabled comparison of difference, interpretation of data, and facilitated the search for confirming/disconfirming evidence of these interpretations (Crabtree & Miller, 1992).

Findings from the study are appended: Appendix A is a copy of the Participant Consent Form used in the study, Appendix B presents an outline of the Interview Questions, Appendix C presents findings related to Culture. Appendix D-F presents findings that relate to three innovations requiring required organizational learning at CFET. Appendix D refers to information related to Coordinated Teams. Appendix E presents comments about the attempts to Organize Client Services, Appendix F present findings related to the curriculum change to modular courses.

Step two: Validation of the data. Once the information was gathered I conducted member checks. Member checks initially involved individual participants and later a final presentation to a team meeting of the Operations Department. Member checks were conducted with each participant interviewed who was given a transcript of their conversation and asked to make corrections or to clarify comments. Themes from this information were presented at the team meeting held at the completion of the research. As much as possible the themes reflected the actual words used during the interviews. My role as the researcher was to sift through the information mining the common themes, identifying the different perspectives, and representing these so that the voice of the respondent described the learning events and their significance.

Step three: Using narrative analysis to identify "thick" processes. I used a narrative analysis following Riessman (1993) to analyze taped transcripts and organizational documents. A "thick" description is an important aspect of the trustworthiness of the research project revealing important aspects of the speaker's coherence between words and intent. Coherence can be global, local, or themal (Riessman, 1993). Global coherence may be used to justify an action. Local coherence is used to affect the narrative itself such as how a person may link events to each other. Themal coherence (Riessman, 1993) relates to the choice of content by the speaker who may cite common themes (orientation, training, debriefing, modeling, etc.) as the central issue.

I examined four aspects using narrative analysis: content, structure, meanings ascribed to experience, and relationships embedded in organizational practices. Narrative analysis links learning and concepts of learning with actual practices described in stories persons told about their experience. An advantage of this type of analysis was that it provided insight based on actual experiences. Individual stories regarding learning was of interest because of the ability of a story to provide precision, duration, and relevance of the actual learning processes (Langley, 1999). Because narrative analysis is interested in linguistic patterns, identity, and cultural systems, it is appropriate to use as a means to study organizational learning.

Content addressed the substance of what was said, focusing on the language used to describe a learning event. Coherence criteria can be used to show that the language chosen was not unplanned, but revealed a rich texture. Narrative analysis uses coherence criteria of global, themal, and local to understanding different expressions used by a person. Since the choice of language represents the speaker's experience and that of the speech community (Riessman, 1993), narrative analysis provided insight into the descriptions of activities and the reasoning process of individuals (Riessman, 1993).

Structure in narrative analysis is a two edged sword. Structure refers to how the parts of an individual narrative are composed, the choice of language, and the use of metaphor. Composition may include the choice of language and metaphor, the sequences told by the narrative, or other linguistic patterns that might represent gender differences. By understanding the different connections of how narratives are structured important learning for the organization could be identified. For example, sequences identified by participant interviews focused attention on how the organizational learning process was related to the individual experiences such as orientation.

Structure also referred to the larger social context. The wider dimension may be important in understanding different approaches to learning issues according to age, gender, or culture. Most intriguing was how structure had concurrent dual dimensions. For example, a narrative was useful to explain a corporate culture emphasizing equality, and at the same time to reinforce a hierarchical organizational culture through the practice of who tells the story (Boje, 1991; Martin, Feldman, Hatch, & Sitkim, 1983). In this study I made efforts to attend to what was said, who was speaking, and what voices were silent.

An empirical study using a narrative method also explores different meanings ascribed to experiences. To resist the temptation to assume that a single interpretation of organizational learning was the only valid interpretation the analysis included local histories of specific units and diverse perspectives of front line personnel. The multiple themes and associations represented the diversity present in the organization. Such an analysis helped to document how new learning becomes practiced in the CFET.

Finally, the analysis of the research findings explored relationships embedded in organizational practices by identifying the patterns of communication and social relationships by which learning was constructed. Patterns of communication represented the different networks of individuals who discussed, interpreted, and represented learning across the organization (Roth, 2000). These conversations were significant in understanding the influence of group interactions on learning: conversations about the meaning of issues and events has shown to relate to the strategic goals of an organization (Bradbury & Mainemelis, 2001; Crossan et al., 1999; Roth, 1996; Thomas et al., 2001).

Step four: Analysis of the archival documents. In analyzing the documents I was interested in the language used to describe learning, the target audience of the learning, the impact that external events might have on learning, and how learning described in archived records related to actual learning processes.

An analysis and comparison of these documents with information gathered by observation and the interviews provided insight into how organizational learning was fostered in the organization. One purpose of the archival research was to document the authenticity of a critical learning incident. For example, the interview process identified how a critical learning event impacted personnel in different ways. Reviewing the actual document helped to authenticate that the learning event was important to the organization and provided insight into the background information provided by the document. A safety procedure or policy could be the result of a lesson learned. Documentation of the procedure in an organizational publication could also lead to further information about how the organization prioritized the learning. Access to additional documents such as memorandums, prior drafts, etc. provided additional information and authenticity of individual accounts regarding different interpretations about these events.

Step five: Writing a learning history. Learning histories have been used as a means to enhance an organization's learning capabilities (Roth, 1996). I prepared and provided a learning history of the organization in a presentation to the CFET community including the CEO and team leaders of the organization. Electronic copies of the slide presentation were distributed to the entire organization prior to the presentation. A learning history uses the words of the organizational members as much as is possible to represent the themes. Members of the organization were invited to write a response to the learning history to correct errors or clarify statements, but no written responses were provided. During the presentation I answered questions as they occurred. Several verbal expressions of approval and acceptance were made during and following the presentation to the team meeting. The feedback process was important and a means for key informants to review findings of the case study report. The learning history addressed these questions:

> How does the CFET identify educational needs?
> What patterns of communication exist that facilitates or inhibits the ability of the organization to process information?
> What is the role of learning in the organization? How is learning conceived?
> What different influences impact learning in the organization?
> How is tacit knowledge transferred to managers and department leaders?
> Are different constructions of learning present in the organization?

Step six: Using narrative analysis to identify actual OL process. Since narrative analysis is interested in linguistic patterns, identity, and cultural systems, it seemed a reasonable means to study organizational learning. My study sought to understand aspects of learning that were situated within the everyday activity and the conditions that fostered this learning. Narrative analysis links learning and concepts of learning with actual practices described in reflections persons provided about their experience. A narrative analysis identified sequences as learning stories were revealed, thus focusing attention on different aspects of the processes of learning. Finally, the narrative analysis also revealed themes and relationships that took place in the situated nature of the individual learning and showed how organizational learning was influenced by these individual events.

Assuring the Believability of the Data

In qualitative research the individual engages in research in a specific setting and attempts to interpret phenomena in terms of the meanings people bring to them (Denzin & Lincoln, 2001). Whether or not the findings are perceived as trustworthy depends on how well the researcher presents information that answers questions about the credibility, transferability, dependability, and authenticity of the research findings (Lincoln & Guba, 1985; Seale, 1999). In this project I hope to have met the demands of trustworthiness by addressing the following issues of trustworthiness.

Credibility. Accepted criteria of credibility that I followed included a prolonged engagement in the field, persistent observation, triangulation, and member checks. The amount of time needed to qualitatively explore any issue is in some ways without boundaries because of the many different levels and aspects of individual meanings that could be explored. Some researchers have suggested a period of up to 18 months. I was engaged in the field for a period of eighteen continuous weeks of observation, from September 2002 to January 2003. In addition the first contact with the CFET organization was in July of 2002 during a get acquainted visit to the site in which I met several key informants. I concluded the fieldwork with a final presentation in April of 2003. The time between February and April 2003 was used to complete transcripts, write a preliminary report, and conduct preliminary analysis of the findings. In April of 2003 I presented a summary learning history during a luncheon meeting with CFET staff. Thus the total time involved in the study was ten months, two months longer than my initial estimate, which assumed that the total time on the site would be 6 to 8 months.

Persistent observation was vital to compiling my primary record. In my observations I attempted to follow suggestions as to how to develop a thick record (Carspecken, 1996) which included notations of the speech acts (gesturing, excitement, loudness, etc.) and body postures, accurate recording of speech vocabulary, frequent time notation records, observer comments, context information, italicized verbatim records, typed notes, and a diagram of the setting. Carsprecken (1996) suggested that passive observation can be successful and have minimal impact on a setting if one identified a priority person and then watched that person for five minutes shifting to a new priority person for another five minutes and so on. I attempted to use this method, but found it difficult for several reasons. Often my observation was interrupted by conversations with persons sitting next to me or entering a room and, consequently, made it difficult to talk directly and observe someone else at the same time. I was able to use this method consistently during meetings with the Network Bridging Team and the community meetings held twice a month. My note taking procedures were made using verbatim notes typed during team meetings, hand written notes recorded during observation, and detailed notes typed within twenty-four hours of the event.

Triangulation was another means to add credibility. I employed multiple methods to gather data including observation, individual interviews, and archival analysis. In this way the personal stories and meaning of events were captured and compared to each other and to written materials of the organization, By using the multiplicity of data I was able to identify a convergence (Seale, 1999) of evidence to support the findings.

Most important to credibility was the ability to verify observation by having members of the organization validate that the observations were accurate. In this research two kinds of member checks were conducted. First, participants interviewed received copies of the interview transcripts as a means to assure accuracy of the transcript information. Second, a research presentation report, the organization's learning history, was prepared and delivered. Individuals from CFET were asked to respond to this report to provide the opportunity to verify the report and respond to any inaccuracies in the observation.

Transferability. Transferability refers to the ability to generalize from the research findings to other settings. Transferability is dependent upon the author's ability to represent a rich and detailed description of the setting studied so that the reader is given the needed information to judge whether or not the information is applicable to another site. From my perspective, detailed notes of the setting and writing of daily reports were important to understanding the context and culture of the organization. The taped interviews were critical to the findings in a final report.

Dependability. Dependability refers to the ability of another researcher to follow in my footsteps so that they could see and reproduce similar results. I used a palm pilot as a logbook to provide an audit trail that allowed my supervisor to act as an auditor. Such a trail also noted the methods used and the decisions that might be made during the course of the research. In addition, a personal journal was kept to explain my reasoning process regarding these events.

My background as a certified counselor contributed to the dependability of the data collection process. Because I have extensive experience in interviewing persons I was comfortable with the interview setting and was experienced at helping others to be comfortable. This background also helped me to ask specific follow up questions and be comfortable with the silence that persons occasionally needed to formulate a response. Also, my background and interest in educational and human development perspectives encouraged persons to share and explore personal insights into the critical learning events that they experienced. However, this perspective no doubt shaped the data I observed and my analysis. I explain these possible biases in a later section.

When I began the data analysis I drew on my skills as an interviewer to focus on the difference between descriptive information and interpretation. This distinction hopefully has helped me to provide accurate details of the setting and situated practices while targeting the significant issues for understanding organizational learning.

Limits of a Case Study Method

In my research the purpose of the case study was to identify and describe the uniqueness and complexity of the organization in a specific time, place, and context. Such a view is characterized as a window study (Czarniawska, 1997), which looks at particular events occurring in the organization at a particular point in time, and attempts to describe as much as possible of what is seen. An advantage of this design was that it allowed me to study the process of social construction in the making (Czarniawska, 1997).

In analyzing the information I was aware of several possible errors, much like drop offs along a narrow path. One error could obscure important cultural issues and meanings that are represented in nuances, subtleties and ambiguities. As a means to resolve context error, Riessman (1993) suggested that one begin from the inside, "from the meanings encoded in the form of the talk, and expand outward, identify, for example underlying propositions that make the talk sensible, including what is taken for granted by speaker and listener" (p. 61). I preferred to use an analysis that privileged the teller of the story because the alternative missed the particular interaction and the social, cultural, and institutional discourses that were significant (Riessman, 1993).

Another potential problem area in a case study design includes setting necessary limits on a case study and limiting bias in the data gathering and reporting (Diesing, 1971). Limits were necessary to focus research onto a particular problem and help to assure that the study was completed in a reasonable amount of time.

Limiting the selection to key informants. To set boundaries in the case study, I gathered information from key informants. The initial contact began with members of the organization who indicated interest and openness to such a study. These persons were liaisons with the organization and helped to identify other key informants from the organization who could be interviewed. The key informants were asked to suggest possible activities that were appropriate for observation. These persons also provide archival materials representing organizational learning in the organization. The purpose of the key informants was to provide a limited number of observation points into the organization while retaining as full as possible a presentation of the complexities involved in understanding how innovative learning became integrated in the organization.

Limiting bias in documentation and analysis. As a researcher I brought my particular skills and limitations to the research. To minimize reporting bias I gathered information about innovative organization learning using three methods: observation, semi-structured interviews, and archival research. However, I realize that another researcher would not have the same interpretive lens and would shape the data differently as well as alter that data because of the presence of a different observer.

Observer bias that might have occurred was addressed in several ways. First, I used skills developed as a clinical counsellor that allowed me to focus on the participant's perspective. Second, I distinguished between observed details and descriptions and my personal reactions in my field notes. I took two types of notes. I noted observations and descriptions of an event (s) and recorded descriptive data such as who was involved, who was talking, where the information was discussed, etc in a notebook. In a different section, I recorded personal reactions and interpretations. Such a practice enabled me to represent and distinguish actual descriptions of a situation from my personal reactions to the event. Finally, I also prepared a preliminary report to my research supervisor and discussed my observations, attitudes, and assumptions that might have impacted my observations.

The above methods were honed during my past clinical training and helped me to focus on the particular comments of individuals. However, this clinical perspective no doubt shaped my analysis in several ways. I tried to avoid a selection bias by interviewing persons assigned to roles and through their recommendations of other persons to interview, but my clinical view might have impacted the choice of persons. Second, clinical training tends to focus on feelings and helping persons gain a new perspective for health. Such a concern for health, not only of individuals but also for the organization, may also have been a possible bias. Also my background working with individuals might have caused me to underplay other structural or socio-cultural aspects of the organizational life such as power and gender. Another researcher without this perspective would have noticed different events and likely drawn different conclusions.

Another means to limit observer bias was archival research. I conducted an archival research of written policies, training manuals, and other examples of organizational learning. This analysis focused attention on written understandings of the organization. By analyzing the actual written documents of the organization selection bias by the researcher was further reduced.

Finally, I prepared a presentation of initial findings as a learning history of the innovative learning in the organization and distributed this document to the participants for feedback and verification. Members of the community had the opportunity to verify the accuracy of the account thus limiting further any bias that could be brought to the study by the researcher.

Ethical Considerations

The study followed both the ethical guidelines of the University of Alberta and the American Psychology Association. The following describes the ethical practices used including: informed consent, confidentiality, protection of research materials, and preventing harm to participants.

Informed consent. The purpose of the research project was explained at the beginning of the research. I presented this information in face-to-face meetings with liaison sponsors representing the organization, during group meetings, and before each interview session with selected participants. In addition, I prepared and distributed to participants a one-page statement describing the purpose and uses of the research, how confidentiality was to be respected, and how individual integrity was valued. Participants in the research project were permitted to withdraw at anytime. Each person was asked to sign a consent form acknowledging that they were informed about the nature of the research and indicating their permission to be observed, to be interviewed, and to have electronic tape recordings of interviews. A copy of the participant consent form follows in Appendix A.

Confidentiality. Confidentiality was discussed with persons in the organization at the outset of the research and when otherwise warranted. Every effort was made to assure that identifying names of individuals and of the organization were not revealed. Only information directly related to the purpose of the research was retained in written and oral reports. The transcriber signed a consent form indicating her willingness to respect and abide by the conditions of confidentiality. In addition, confidential information obtained was discussed only with my research supervisor. Individuals who were interviewed received copies of the interview transcript for their information and verification and these transcriptions were edited to remove identifying names, titles, and locations.

Protection of research materials. Copies of interviews, notes taken during observation, and other research information such as journals, sketches, etc. remained in the custody the researcher and were kept in a locked area and compartment when not in use. Initials and number codes were assigned to participants to remove any material that could personally identify an individual. In all cases every effort was made by the researcher to adhere to the ethical principles of the University of Alberta, the appropriate professional organization of the client, and guidelines for ethical standards in the publication manual of the American Psychological Association.

Harm to participants. No participant was subjected to any psychological or physical tests or placed in a situation of risk. The number of participants observed and interviewed was limited to naturally occurring events in the CFET Operations Department, Network Bridging Team, and to the participants interviewed. The identity of each participant was numerically assigned to ensure anonymity.

Summary

The study followed an interpretive qualitative method to study organizational learning at the Centre for Fire and Emergency Training located in Western Canada. The interpretive study was selected to study actual processes within the organization that supported or inhibited organizational learning. The study used a case study approach combining observation, semi-structured interviews, and archival research. Participants were informed about the nature of the research study and signed a Participant Consent form before the study began. Interviews were tape recorded and transcribed. The text of these transcriptions provided the basis of a rolling review and narrative analysis. Rolling review simply means that that the interviews were previewed, read, reread, and coded before being subjected to a narrative analysis. A narrative analysis of the study included review of the interviews as to the language, content, and patterns of conversation that were indicated in the expressed views of the participants and went through several stages of interpretation. The initial stage coded words according to the actual words used by the participants. A second stage grouped these words in clusters I formed through interpretation. During the research I continued to dialogue with the texts, often sketching conversational patterns and linkages to show relationships of people and things finally forming a collection of findings divided into two areas: culture, and innovations that required organizational learning. These findings are discussed in the next two chapters.

One additional note pertains to how I have chosen to present an individual's quotations. At the end of each selection I have provided a pseudonym along with the work role and length of years with the centre. Because the organization is small I have chosen to minimize identification of individuals by listing the years of service as less than five years, more than five years, and more than ten years. To protect confidentiality I have grouped together both senior management and team leaders under the general area: team leaders/management. Staff and Instructors are similarly grouped as staff/instructors without designating the particular area such as finance, registrar, curriculum, etc. Also, some selections have a letter beginning a statement. The letter "S" refers to the person (subject) interviewed. The letter "I" refers to the interviewer.

CHAPTER FOUR

"FLYING UNDER OUR OWN POWER"

This chapter presents an ethnographic portrait of the Centre for Fire and Emergency Training. It portrays the context and is important for understanding the norms and values influencing the interactions and activities that created knowledge in this organization. Further, this examination of culture also illustrates the very practices that embed ongoing learning. These practices reveal how the community learns as actors participate in everyday events, sharing meanings and responding to one another. Appendix C summarizes the comments that related to culture at CFET.

Findings suggest that OL at CFET was impacted by two cultural conditions and two change processes described in the following sections. First, I explain the two cultural conditions that impacted OL at CFET—the general characteristics of fire fighters and trust in community. Second, I describe the two change processes requiring organizational learning—leaving government and a community in the midst of change. The chapter concludes using a series of critical cultural questions to discuss and summarize the impact CFET culture had on OL. The key cultural questions were: What are the unique foundations of the culture? What are the most significant changes to the culture? What remains constant despite the change? From an organizational learning lens how do the changes occur? What cultural constants seem to support learning and change? What were the conflicts and tensions?

Cultural Condition #1: Characteristics of a Fire Fighting Culture

The common experience of fighting fires bonds fire fighters across regions, provinces, and nations in a concern for saving lives and property. Fire fighters often express this cross-cultural bond by exchanging "flashes," which are cloth arm badges identifying a town, city, or fire fighting centre, and a symbol pointing toward the common bonding experience. On my first day in the field, I experienced one example of the common bond of fire fighters. During a tour of the fire and emergency centre I was introduced to different persons whom we happened to meet during the tour. Several of the fire fighting instructors, after hearing who I was and that I was going to study organizational learning at CFET, asked, "Are you going to get dirty?" Since other persons such as the Registrar or administrative staff didn't ask me this question I concluded that asking that question was related to the common experience that distinguishes a fire fighter. The fire fighting instructors wondered if I was going to put on the bunker gear of a fire fighter, go into a real fire simulation, and experience the fire fighter's world that is filled with water, smoke, and heat. Characteristics related to the general culture of fire fighters included the distinctions drawn between fire fighters and civilians, the first fire experience, the attitude of aggressiveness, and the importance of volunteer fire fighters.

Fire fighting members and civilians. One means by which the experience of being a fire fighter is shared with civilians is through the stories that are told. Type "fire fighter" on an online search and Google responds with pages of resources about fire fighting. Many of these pages tell stories of experiences in which individuals are transformed and become fire fighter members. First person encounters of "My first real fire" (Weaver, 2000) or "Fallen Friend" (McMillan, 1996) describe the boundary line between member and non-member. The secular prayer "I wish you could know," (Wood, 2000) tells the experience of the fire fighter crawling beneath flames searching for a child. Or the way in which a fire fighter attempts CPR on a woman's husband, even though there was no pulse, to show her that the fire fighter tried everything to save her husband of forty years. The prayer asks the reader to understand the thoughts of the fire fighter as he extricates a young teenager from a crashed automobile. The prayer ends noting that the reader will never truly understand or appreciate what the job really means to the fire fighter "until you have lived this kind of life." Within these stories are the cultural threads of fire fighters: rescuing life, saving property, courage under fire, respect for one another, and close camaraderie.

The first fire. The fire fighting experience also is a personal transformation in which a fire fighter discovers how he or she will respond to an actual fire. One such trial by fire experience was shared with me prior to a meeting of the CFET Advisory Board.

Hoping to learn something about how CFET was perceived I struck up a conversation with a representative from a rural fire department. I recall asking general questions about when the officer first became involved with the fire fighting centre. He had initially gone to basic fire fighting courses twenty years previously and had continued to attend fire commander training courses at CFET as he followed a career path from fire fighter to commanding officer. The conversation sparked when I asked how his training helped him to fight fires. Turning toward me and looking directly in my eyes he told the story of his first fire. He had just been hired by the city located in the western part of the province, but did not have previous fire fighting experience. It was winter and because of a heavy overnight snow he had had difficulty getting to work. Only he and the commander had managed to get to work when the call came in. It was a fire in a downtown building, and the flames threatened to spread to a nearby structure.

After arriving at the scene the commander decided to attack the fire through the front door; the officer was given a hose and directed to fight the fire from the rear. The officer paused in the midst of his story and reflected that the message to split and attack the fire from separate directions went against all rules he had learned about fire fighting safety and never entering a fire alone. Returning to his story, the officer described flames rolling out the windows as he was entering and feeling the heat and the force of the fire. The combination of cold temperatures, snow, and water had made for an icy floor causing him to slip and fall on his back as soon as he entered. Smoke was thick and visibility was poor. He did not tell me if he was wearing the self-contained breathing apparatus (SCUBA) that is a requirement, but if he was, cold weather fire fighting creates additional problems of visibility such as condensation freezing on the mask. Even though he tried to stand up the slippery footing combined with the pressure created by the water pumped through the hose made it impossible. The officer recalled the feeling of confusion of lying on his back and seeing flames break through the ceiling. What came to his mind was his only fire fighting instruction, "Put the wet stuff on the red stuff!" Repeating this phrase he focused and fought the fire, lying down, pointing the nozzle at the rolling flames. Having heard the call, other fire fighters soon arrived and joined in the fight to prevent the fire from spreading.

This example is an illustration of the culture of fire fighters that often describes a transformation process in which a person discovers courage to face risk and maintain poise under pressure, as well as the ability to work with and trust colleagues.

Aggressiveness. Fire fighters are aggressive. The culture of fire fighting uses aggressive language. Fires are fought. Strategy is directed by a command and control center that actively *attacks* a fire. In the past the aggressiveness of fire fighters has attracted and been limited to males, but even as the fire fighting industry is now adapting to female fire fighters the aggressive element seems to continue. Gord, an instructor interviewed, described the culture as "a roomful of, you know, testosterone-charged Type A personalities." The use of the term "Type A personality" in this context is indicating a general description of persons who are aggressive, controlling, and more often take charge of a situation rather than the clinical definition that would include symptoms such as hypertension, high blood pressure, or rapid talking.

The persons who engage in fire fighting must face challenges under pressure that are physical and mental. The physical demands reach levels of exertion that significantly increase the danger of cardio arrest in fire fighters. The mental factors of entering a fire require alertness to what is happening and the need for quick decision-making and rapid response. Mistakes in fire fighting occur and fire fighters must always be able to adapt to a changing situation, but the margin of error is slim and the consequence of error can result in the loss of life.

In recent years the emphasis on fire fighting has begun to shift toward an emphasis on emergency preparedness and fire prevention. Fire fighters also respond to motor vehicle crashes and are involved in vehicle extraction. These cases involve less threat to the fire fighter, but may require greater caution and carefulness in protecting the life of an injured person. Also, fire departments are recognizing that although less exciting than fire fighting, fire prevention and fire safety practices such as smoke alarms actually save more lives and property than fighting fires.

Importance of volunteers. Finally, volunteer fire fighters make up the highest percentage of provincial fire fighters and fire departments. According to the Alberta Fire Commissioner's Office there are eight full time fire departments compared with 388 volunteer fire departments in the province. An additional 34 municipalities have a composite of full time officers and volunteer fire fighters. Although the actual number of fire fighters is not known, the Alberta Fire Commissioner's Office estimates that approximately 3000 fire fighters are full time and 9000 are volunteers[1]. It is clear that volunteers rather than paid professionals make up the bulk of actual fire fighters. The proportion is even higher in industry where the vast majority of fire fighters are employees who work full time at a job completely different than fire fighting. One can speculate as to what motivates these persons to volunteer, but it seems safe to assume that the desire to protect life and property and the common bond with other fire fighters would be atop any top ten reasons why someone would be a fire fighter. Interestingly, the distinction between volunteers and full time fire fighters often involves differences such as who can be members of a fire fighters union or differences in training. Full time fire fighters tend to work in larger cities and these cities often provide their own practice and fire training facilities. Volunteer fire fighters often serve in small rural municipalities and seem to prefer flexible short-term training periods. Although over the life of the CFET it has provided training for both full time and volunteer fire fighters the training programs have tended to be directed more toward volunteer fire fighters in recent years.

Cultural Condition #2: Trust in Community

The theme trust in community was an important cultural condition at CFET. Appendix C shows that seventeen persons made forty-one references to trust.

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[1] These numbers provided in private correspondence with the Fire Commissioner's office.

Interestingly, no single reference in this category totaled more than four; instead interviewees often used terms such as family, close, and tight-knit to describe the centre community. This section discusses a number of the conditions that seemed related to trust in community including references to: the family and family unit, annual Christmas meetings, daily interactions, ongoing care and concern, trust, infractions, playfulness, and the difficulties of fitting into the culture

Family and family units. In the following quote this particular employee had begun work at the centre as an intern from the college and now had the longest tenure of any employee. Barbara commented on the nature of the community that she experienced at CFET.

> And at that time, because we were small, it was more -- it was a more intimate organization with all the people that worked here -- we were almost like a family. We had more social get-togethers than we do currently with, you know, 48 staff or whatever...and we played -- we had a slo-pitch team that we would always play every Tuesday night against the students -- like, that was just a thing we did in the summer, so there was that close-knit environment that, as you grow bigger, it seems to just dissolve -- I think you get close-knit within units but not the organization as a staff-wise. *(Barbara: TL/Management, over 10 years with centre)*

In this case the employee realized that the growth in staff numbers made it impossible to maintain the close social activities that involved the whole community as a family. However, she believed that the close-knit nature of family continued in units within the organization.

Everyone at the centre did not share the perception of distinct and separate individual departments. For example another employee who represented someone hired during the recent period of rapid increase in staff saw it differently.

> There's no distinct departments, although it is going that way but there's no—there's still a tremendous amount of overlap and just the support from

> your peers is excellent and very good. *(Winnie: Staff/Instructor, over five years with centre)*

For this person even though the small, family-like organization had changed as the organization increased numbers of employees, the intimate connection was valued and the ability to support each other provided a sense of belonging that was for her more unifying than distinct departments.

Christmas meetings. In addition to the ability to participate in social gatherings another characteristic of the community was the ability to speak and be listened to in an inclusive community setting. A tradition at the centre that conveyed the importance of retaining a close community was the annual "Christmas Meetings". The first week of January was set-aside for "Christmas Meetings" in which everyone in the organization came together and discussed organizational issues. The meetings were an expected part of the beginning of each calendar year. One person, a faculty member, made the following response when asked to describe a critical learning event.

> In addition to that, we've also had our -- we call 'Christmas Meetings', and in that time period, it would a time of learning for the staff, either from each other -- in-house learning session without having outside people come in and teach, and information sharing then at that point as well. *(Stephen: Staff/Instructor, over five years with centre)*

This was the first time that Christmas meetings were mentioned to me. It seemed that for this speaker, the annual gathering was an important time for community sharing and an opportunity for the collective to hear and learn together. The importance of the Christmas meetings was mentioned several different times during my site observation, and I was encouraged by a number of staff members to attend the 2003 meetings.

The Christmas meetings appeared to be a naturally occurring event indicative of the shared valued place on the community collectively gathering to discuss and learn as a community. Ken, a person who had developed a new software management program shared that he was planning to present the program to the Christmas meeting because no one had seen all the possibilities of the new program.

> S We're planning a thing this Christmas -- you've probably heard of our 'Christmas Meetings'?
>
> I Mm hm.
>
> S Um, for the first time on SAM we're going to do a public overview of SAM, which is going to be about a two and a half or three hour session that I'm going to do... *(Ken: Staff/Instructor, over 5 years with centre)*

It seemed that the Christmas meetings served as time for community reflection and community building, as well as a continuing a historical tradition signifying the collective unity of the whole. Plans for the annual event were discussed in the Network Bridging Team and then developed and shaped by either persons or groups representing staff and management. The information was shared because it had attained a level of importance such that everyone should learn more about the issue. What then followed was a discussion by the community that provided members with the opportunity to both shape and be shaped by the participation.

Daily interactions. Community experiences and sharing was an important part of daily routine at the Centre for Fire and Emergency Training. Much of the activity at CFET occurred in a staff conference room, which served as a central meeting place for people and activities. Tables were grouped together to form a large conference table. Chairs were placed around the conference table. The table often was covered with daily newspapers, various industry magazines, and catalogues. People entered the room to send faxes, use the copy machine, and collect personal mail from individual mailboxes stacked on top of cupboards. Much activity occurred in the small kitchen adjacent to the conference room that had a three-pot coffee machine. The kitchen also was a storage area for cold soft drinks for guests, kept cold in a small refrigerator, and staff lunches and drinks stored in a larger refrigerator. A microwave was on the countertop next to the sink. Throughout the day individuals engaged in a wide range of conversations as they met each other in the room. Informal conversations began as staff gathered for work at 7:30 AM. There was a coffee break scheduled between 10:00-10:15 AM and between 3:00-3:15 PM each day. Although many staff chose to have lunch away from the work setting there usually were between five to ten people who sat at the conference table eating a lunch they had brought from home or purchased at a nearby fast food outlet.

Another feature of this room was the information on walls surrounding the conference tables. A large white board dominated one wall and was continually updated with news in the organization. At the other end of the room were posters of the vision, mission, and values of the organization. What seemed to be important and represented in the different locations of the room was information sharing about the everyday interactions in the work setting. Still the focus of the room seemed to be the activity that occurred at the conference tables. A technician noted that the coffee time served not only a social purpose, but was a means to make connections.

> S A lot of things get initiated over coffee but most of them are initiated in the morning coffee -- I'm not as productive in the (afternoon break). But at the 8:00 one ...
>
> I Yeah, the 8:00 one -- yeah, I've not been here for that one -- well, actually, I was here for one of them.
>
> S People regret the fact that they're not able to get here all the time for 8:00 coffee...Because a lot of things get talked about.
> *(Ken: Staff/Instructor, over five years with centre)*

The kind of things that were talked about varied. During my observation I planned to sit at the conference table both during break as well as at other times during the day to become acquainted with the diverse kind of interactions that occurred.

The exchange of information in the coffee room seemed to assume an open invitation for anyone to participate in the discussion. Often discussions involved a cross section of staff and discussed operations that were occurring in the field. For example, one day while sitting at coffee I noted the following exchange.

> 10/09/02: approximately 10:15 Raymond enters the room and asks out loud to those gathered, "Has anyone seen the dangerous goods (DG) tent? A number of people join the discussion and offer their thoughts on where to find the DG tent. One male technician reports that they found the bag for the roof and poles, but do not know where the sides are. A faculty member asked, "Have you looked in the tin shed?" A female staff member asked, "Is it in the back of the theatre?" Another faculty asked, " Is it in secret storage area?" Raymond answers that he had looked in the secret area and did not find the tent. The faculty member responds, "Guess it's not secret anymore." The group erupts into laughter. No one seems to know where the tent is.

In this case the technician was trying to locate equipment that was necessary for a particular course, and used the mixed group as a whole for his resource. In this example other non-faculty also participated. A similar invitation was made on another occasion when the conversation involved plans to decorate the Christmas float.

Care and concern. Some members of the organization maintained a watching and reminding role about the need to sustain care and respect for others. I observed several examples that seemed to express care and concern for persons in the organization. Speaking at the Christmas meetings the CEO noted that it was important to be able to laugh *with* someone rather than to laugh *at* someone. He emphasized that the cultural values speak to respect and empathy for persons. Another example I noticed were the printed guidelines for conveners of the community meeting. These guidelines, thumb-tacked to an employee information board in the coffee room, identified the importance of being honest and respecting differences between persons.

Another person noted how the concern for persons was shared in the organization.

> I know that, um, even in the coffee room, there have been a couple of people called on values. For example, I can't remember the exact comment but I know that somebody made a rather derogatory comment to somebody else and one of our staff members said 'values -- and we have them on the board ... And I think we kind of -- I think we watch out for each other and I think we -- like, we have them there and at every opportunity, I think we look at them and -- as a group, in fact, you know we've -- a few meetings we have gone over the values and, you know, talked about them and so I think they're in the back of everybody's mind, and so I think we're just sort of -- we're always conscious of them.
> *(Jesse: Staff/Instructor, over five years with centre)*

Having persons remind others about the values of the organization and the safety of persons was an important way that the organization appeared to be learning to sustain the close-knit connections of the past.

Trust. The close intimacy in the organization valued trust between individuals and between the individual and the organization. The common fire fighting background of experience in part held the trust level together. The kind of trust specific to fire fighters seemed to be two fold. There was a basic level of trust built on having confidence in the other's skills and ability to follow safety and fire fighting procedures. For example, one fire fighting technique attacks a fire with two streams of water. One stream attacks the fire directly. The second is a lifeline that protects those who enter the fire. If the team enters too fast or if the fire suddenly changes directions the attack team could be surrounded by fire. The purpose of the lifeline is to push back the fire so the attack hose team is not lost. The basic trust relies on people knowing and responding, as one would expect. A second kind of trust is grounded in relationships and actual experience. In this case the fire fighter not only trusts the basic skill level, he or she trusts a particular person because they have had a history of consistent performance together over time and in actual conditions.

Another dimension of trust evident goes beyond the basic skill level and performance level of trust: trust in the organization. At CFET this level of trust in the organization was reflected in communication patterns that fostered sharing across all levels in the organization. A staff member commented about the different kinds of trust.

> I guess, in my mind, there are two things…where we benefit to maybe maintain that (level of trust). Number one is probably being fire fighters, right? They're a special breed I think….where some of the difference is because of that fire fighter mentality and then the other thing that I think is the leadership that's here -- the people that they have leading this organization are topnotch, in my mind -- like, I have so much respect for some of the people in this organization and their leadership skills and the talent that's here and I think that's probably one of the things that's going to help to like, you know, for instance Ian -- you know, he -- as a CEO, he's constantly in touch with the people here -- you know, even in today's meeting, he gives you the 'well done' and the applause and, you know, makes sure that you feel that you're actually being rewarded and that so that's one of the things -- I think those are probably the two things I can see would help keep this organization moving towards to becoming excellence that they are because it, you know, it seems to draw more excellent people in, right, and I don't know if it's drawing them in or just these people know what to look for (in the) people that they're hiring and I think that's got to make a difference here for sure. Because, like I said, the people here that are up in upper management, the talent is phenomenal. *(Elwyn, Staff/Instructor, less than five years with centre).*

In this case he was confident not only in the close-knit nature of the fire fighting community, he also trusted the leadership of the organization. He trusted their judgement, their ability to assess talent, and the decisions that were made. These comments seemed to go beyond a simple acceptance based on an authoritarian respect for the chain of command and included an appreciation of the person of the CEO who gave encouragement and made good decisions. This level of trust in the organization leadership went beyond trusting the skills and performance of another, to interactions between the CEO and staff that fostered acceptance and understanding, which in turn appeared to increase staff confidence and trust in the decisions that impacted the entire organization.

Another staff member described how she trusted the ability of the other staff to work together to overcome problems: in this case, the staff worked together to fix an unexpected break in a main water pipe.

> Well, I think everybody -- the thing that makes this such a good place to work is that everybody is willing to put out and make things work and if things come up that have fallen through the cracks, it seems that everybody can pull together and it works -- like, when the pipes all broke in the summer time, I don't know what happened but I know that all of the courses still went on, even though they had problems with water supply and so that would seem to be a vital thing, but everybody -- I'm sure there were people here 'til all hours of the morning and night making sure that everything worked, and it did. *(Christina, Staff/Instructor, over ten years with centre)*

In this example the speaker did not contribute to the problem solving process, but was aware that a serious problem had occurred and been solved. The satisfactory resolution of that problem was for this speaker an illustration that "everybody can pull together". The confidence expressed in the commitment to resolving the problem and the collective sense that everybody contributed to the resolution created for this person a sense of trust that "everyone is willing to help out".

Other persons interviewed expressed a similar belief in the willingness of persons to help one another in the work setting. For example, one staff member commented on the help received.

> Um, like everybody's -- everybody's a team player, they help each other, you know -- like, I know myself, if I get away down -- Accounts Receivable will say 'hey, (nickname), do you need any help' and I'd say 'sure' and they're there. *(Darrin, Staff/Instructor, less than five years with centre)*

In this case the help was offered as the person picked up on a non-verbal cue. I believe the speaker understood the cue as visual. The other could see when her accounts were literally stacked up on her desk. The fact that persons were attentive to the workload of another and perceived as willing to provide assistance likely enhanced a shared sense of mutual trust and caring in this organization.

Another community member elaborated on the mutual caring.

> I think it's part culture. One of the things that I've felt since I came here, (and saw it) even when I worked at the Community College, was that there's a very strong support for an individual to succeed. People will not go out of their way to see that you fail. They will, by and large, do everything they can to help you and you've see the whiteboard activity -- a lot of organizations, with a kind of fowl-ups that we sometimes have here, people would be kicking stones down the road, you know. Ian's very much a belief that's if you're not doing anything, you're not making mistakes. *(Shirley, TL/Management, less than five years with centre)*

This person's interpretation included not only the hope of success, which one could find in a number of settings, but also a sense of support even if a mistake was made. The disciplinary mechanism through which an organization recognizes and reports mistakes is an important characteristic of high reliable organizations. The CFET culture featured an interesting balance of discipline, playfulness and humor, most notably through the treatment of "infractions".

Infractions. During my first visit I noticed that in one corner of the white board in the staff room a person's name was printed under the word INFRACTIONS. Infractions were a particular kind of mistake that applied to mental errors committed at CFET. If a tool was misplaced, a truck not refilled with fuel, or a similar error made, then an infraction was assigned and the transgressor's name was written in a corner of the community white board under the word infraction. The consequence was that the name remained on the board until the person brought donuts to the coffee break.

It seemed that the most often cited infraction during my observation was failing to use the new name of the organization. I did not hear or see references to accidents or mistakes that resulted in serious personal injury included under infractions. For example, on one occasion an incident report that involved a student who became ill was prepared and discussed during a community meeting, but was not considered an infraction. That discussion focused on making people aware of the procedures and policy for calling an ambulance, summarized as, "If you have a question call the ambulance." Infractions put an emphasis on mental errors such as giving a faculty member the wrong location or date for a course or saying the former name of the organization during a pubic presentation.

This system of "disciplining" may have had both serious as well as humorous purposes. More than one person recalled the story of a memorable infraction in which a senior faculty member forgot to disengage a pumper spray hose on the truck he was driving. In spite of persons waving frantically at him to stop he continued to drive through from the practice field to the main building and in the process broke all the windows in one side of the centre building. People told this story in hushed tones but also with a playful laugh at such a blunder. Infractions could be given to all staff including, perhaps especially, management. One day I arrived at the centre and noted that the CEO's name was listed on the white board. He had been driving a company car and was unable to restart the car after stopping at a nearby fire site location. After calling in assistance from the maintenance team they arrived and were able to start the car immediately. The problem was that the CEO was using a similar looking key from his personal car and it wouldn't work in the company car. As a result his name was on the board along with drawings depicting a stick figure with two keys, a personal and family car, and arrows connecting the correct key to the correct car.

The "infraction" seemed to be a part of the fun as well as a means to limit mistakes. Persons who were responsible for selecting whose name appeared on the board were termed the donut police, and although one or two persons usually acted as unofficial members, the membership seemed to be a responsibility shared by all. A team leader described her experience of an infraction in which she did not wait to have her name listed.

> I What's your sense of the infraction messages and that -- do you ...
>
> S Oh, I think it's great, until I'm the brunt of it.
>
> I Have you been the brunt of it?
>
> S Oh, I certainly have.
>
> I When you mess up somebody's payroll I suppose you get up there.
>
> S I did -- I bought donuts for that one without even having it make the whiteboard. But, no, I ran over a charged hose one time and I was over it before I realized what I'd done. Stuff happens.
>
> I So your name goes on the whiteboard but that's essentially the penalty -- I mean, you have to pay donuts and that but there's enough people on it so...
>
> S But you know what?
>
> I What?
>
> S Very seldom does a name ever go up there for the same infraction twice. So, even though people are making mistakes, they're learning from

> them -- they might do something else totally stupid but they don't very often get caught with a second infraction of the same nature.
> *(Shirley, TL/ Management, less than five years with centre)*

High reliability organizations pay attention to failures and often honor those who make them. The reason is that underreporting of mistakes leads to greater problems (Weick & Sutcliffe, 2001). Donut infractions may have had multiple layers in the culture of the organization. They may have been a source of good-natured humor and acceptance, but were also a means to maintain surveillance and encourage alertness in all staff. The importance of surveillance should not be underestimated. No single person could manage to watch every action of every person at all times. Reporting infractions encouraged alertness to maintaining accountability to each other as members of the CFET team culture. Surveillance could be an oppressive aspect of rules and procedures but by engaging in surveillance as a process of enforcing 'donut fees' on one another to identify infractions, CFET seemed to soften the disciplinary gaze with a playful collective spirit. The collective participation also shifted the gaze continually so that there was no single regulatory authority. Staff appeared to have internalized the surveillance. One employee who was responsible for paying reimbursements described to me why it was important to turn in corporate receipts for gasoline purchases. Following her explanation she added,

> And, if they don't show up, then I put it on the report and whoever didn't turn it in has to buy donuts. *(Darrin, Staff/Instructor, less than five years with centre)*

Surveillance also has an element of enforcement that is necessary. In this case CFET seemed to have found a means to foster mutual accountability without an overwhelming sense of heavy-handed authority. Because such constant surveillance could also be oppressive, the donut police infractions relieved the oppressive aspects of surveillance and enabled persons to have a laugh with the community as a whole.

Playfulness. Play was important at CFET. The training was strenuous. Even in a training situation under controlled fire conditions the physical demands on fire fighters were strenuous. Fire fighters will train by running as much as one block in full equipment to a burning building. Full equipment included a self-contained breathing apparatus (SCUBA) mask and oxygen tank, heavy fire resistant bunker gear worn over normal clothing, gloves, as well as tools such as axes, hoses, and ladders. The SCUBA gear resulted in 85% oxygen efficiency, which meant that the gear itself reduced normal oxygen intake by 15%. This reduction was because the air first had to pass through a ½ inch diameter hose as well as protective mask before the air entered the lungs. Physical exertion only increased the amount of oxygen needed, resulting in heightened cardiopulmonary stress.

Instructors experienced a different kind of stress. Even though the physical demands were lessened for the instructors who were not required to carry the heavy full equipment required for students, teaching was no less stressful. Classes could be as large as forty students to one faculty instructor. Even in smaller ratios faculty were responsible for safe instruction practices. Students varied greatly in their amount of experience. Volunteer fire fighters attending a summer weeklong course might not have used SCUBA gear in a previous 12-month period. An instructor may not only have to teach the particular subject but may be required to monitor and provide on the spot basic instruction in how to utilize the breathing apparatus.

The campus of CFET was busy. The parking lot was full, particularly during the fire fighting season April through October. On several occasions during my field experience I parked in a temporary grass parking area rather than on the paved lot. The increased number of students meant that all persons had more work to perform. Inside the CFET administrative staff have little day-to-day contact with students, but were busy answering phones, grading and preparing tests, organizing materials for courses, or responding to unexpected demands from clients.

In spite of the work pressure, and perhaps as a release of the pressure, the organization fostered having fun. The CEO had on his shelf a book entitled *300 Ways to have Fun at Work,* and encouraged people to have fun. One way this happened was in the give and take during the coffee hour; sometimes the entire organization was in on the joke.

> I Mm hm. No, I don't -- I've not heard people telling jokes -- now, I'm sure that happens but I just haven't -- but I have seen, you know, the kidding, the sort of -- the having fun.
>
> S Yeah. It isn't the formal comedy thing, but it's the crap that happens behind the scenes -- like, have you heard of the story about Tim being new here? We got him to help lift something in the extinguisher lab 'cause we kind of got this idea we wanted to see how much he weighed, so we had two people on either side of the scale -- the only place for him to step was on the scale, so we were lifting this thing up there and finally it got too high for him to lift 'cause the two guys orchestrated to the 'enth degree, you know, so we finally got the ladder off of his body so it wasn't weighing him and then Ray's down there on the scale doing the weigh thing. Well, can you imagine when he looks down and sees what he's doing -- just -- just crazy, you know.
>
> I That was an initiation, right?
>
> S Oh yeah. Look at how much more comfortable he feels because that -- if you're willing to do something like that to somebody, you've got to kind of like them. *(Ken, Staff/Instructor, over five years with centre)*

The importance of having fun appeared to serve as a release of the pressure experienced by the staff. In the previous example, weighing in the new employee, humor served as a means to break down barriers that can be built between management and staff. The senior manager was humorously brought in on the joke that resulted, at least for the storyteller, in a more comfortable working relationship.

Much of the humor expressed at CFET was boisterous and often the center stage of what was heard in the coffee room. The consultant involved in continuing education with CFET described some of the humor as the kind one might hear from adolescent males and wondered if it might have been oppressive to the women at CFET. Although I did not keep an exact count my impression was that the younger women chose to participate in the give and take joking during coffee breaks. The older women seemed to be less involved in give and take, choosing instead to observe and laugh but not to interact. Finally, there were men and women who seemingly ignored the ongoing humorous give and take and engaged in conversations between two and three persons. However, humor appeared to have a central role in the daily life of this organization. It seemed intended to be fun and a way of creating connections between persons.

In the following illustration the prank was pulled on two men, when a woman used her pregnancy to scare them. What was noteworthy about this story was that it took place over radiophones heard by the entire CFET community. In this case only the women were tipped off in advance that a prank was to be pulled. The teller of this story was one of the men involved.

> Jill one time got up into the closing store -- this bunker gear room with Raymond and me. She was pregnant at the time. She took a balloon filled with water -- red water color and had it between her legs and squeezed it and broke the water up on the floor -- everybody in the whole institution

> was in on it but us two. They wanted to get us 'cause we're always up to practical jokes, eh, and they got us big time 'cause we panicked and we were ripping up sheets and boiling water and -- but it was just -- it was just tremendous -- we can laugh with them or laugh at them or it doesn't matter but boy, I really think that brings people closer. I really do. *(Ken, Staff/Instructor, over five years with centre)*

Humor has been associated with learning because humor can simultaneously blur and support social distinctions (Weick & Westley, 1996). By blurring these distinctions, humor can ease tensions between management and staff. Weick and Westley (1996) also suggest that humor can be a means to foster creativity, flexibility, and insight without the loss of order.

Humor, however, was not always positive for everyone. One person I interviewed did not feel comfortable because of the constant joking. I observed her participating in the joking back and forth and was surprised that in a private conversation she revealed that she had a public self she showed at work, but also a private part of her that she didn't feel safe sharing. Her reasons for feeling guarded would suggest her identity and therefore are omitted, but she indicated that she tried to protect the private self from the possibility of the ongoing humor.

The following example reveals how laughter may also cover over existing problems. One long time member reported a comment made by a human resource person from the nearby college.

> S How -- well, we have been described as 'the wolves that will eat our young'.
>
> I Mm hm. And who described you that way?
>
> S Um, the HR person from the community college.
>
> I Mm hm.

S She laughed at us so that's what she felt we were like, so I suppose having that...

I What did you think when she said that?

S We laughed. But, I'm wondering if it isn't -- it may not be...

I So laughter meaning yeah, we do -- you know us very well...

S I think we all kind of laughed and went oh yeah, we probably do and I think maybe it's not so much in verbal but as in other ways that these people are feeling marginalized and maybe it's -- I don't know, I haven't really thought about it but it could be that we're all running and, yeah, you either got to keep up or (leave)-- and I think they have ...(left the organization). *(Barbara, TL/Management, over ten years with centre)*

Laughter in this case may have been a nervous reaction hiding a larger issue facing the community. The laughter response followed by what seemed to be a rationalization that persons either fit in the organization or leave may have masked an unexplored aspect of the organization. A group 'that eats their young' is not my understanding of a pack of wolves. However, the juxtaposition may have indicated at the least that the outsider did not have a clear understanding of the culture, and at the worst, that CFET was not safe.

Difficulties fitting into the culture. Another characteristic of the CFET culture was that newcomers had to take the initiative to be accepted by the community and to adopt its norms. There seemed to be little that oriented a new staff member to the practices and customs of CFET. One staff member commented on the lack of orientation information.

S I think there's still a lot more to do...because we're changing all the time and there are new people coming all of the time...When we were small, it was easy to say well you can just sit in; whereas, I think we've -- we're learning that you have to give people a lot more orientation to the whole structure and purpose and what we're doing here.

I Mm hm. Is there a formal orientation?

S There isn't. I don't think so but there should be -- a lot more than what there is because there's so much to learn -- the way the organization

> works, what everybody's role is within -- the instructors especially coming and having to teach -- they're supposed only teach programs that they have taken and they're supposed to sort of serve an apprenticeship, be on a team with a team leader supervising and -- but a lot of them get thrown to the wolves I think and I really empathize, sympathize with them.
> *(Christina, Staff/Instructor, over ten years with centre)*

One of the ways that persons became oriented to CFET was by having previous experience with CFET: as a part-time employee, through an educational placement from the local community college, or through prior work experience with the centre. For example, during my observation period two faculty members were hired to fill existing vacancies and both were drawn from a pool of part-time instructors at the centre. I also talked with two administrative staff hired within the past three years and each was initially a student placement from the local community college. Finally, a number of CFET staff were previously employed at the community college and were knowledgeable about the CFET organization including the financial team leader, the executive assistant, the information technology coordinator, a distance education coordinator, and an accounts payable administrative staff member.

It seemed that the organization was striving to find positive ways to reduce the difficulties of fitting into the organization. One example of this was changing the length of time necessary to qualify for pension credit. According to past pension policy, persons joining the organization were placed on a two-year trial period during which no pension was credited. During my observation this policy was considered an impediment to hiring new staff. A new policy changed the requirements to a one-year trial period and added credit for the trial year when the person became a permanent employee. One faculty member hired only accepted the position after being assured that the pension credit policy would be changed. The Network Bridging Team accepted the proposed change in the pension policy in December 2002 (personal communication NBT meeting Dec. 4, 2002). However, the staff association was required to vote formal adoption before the policy could be change. When I asked the president of the staff association if there would be resistance to this change he was realistic, noting that yes, those recently hired would not like it, but he did not think that the majority would want to penalize new persons. The final announcement was made in February of 2003 (email notice from CEO, February 6, 2003). This change in the pension credit policy also included an option for existing employees to purchase additional years to their personal pension plan. The change in how pension credit was calculated was one example of the different adjustments that persons were expected to make to fit into the organization.

Persons were expected to find their own way and were expected to aggressively defend one's interests. One team leader tried to describe what he thought was important for new comers to do to fit into the organization.

> S Well, I don't even really know -- like, it was such a flurry, such a blur -- you come from an institute that's -- you just putting out a product and you go to work every day and do the same kind of things and then you come here and -- to survive here, you have to be very aggressive. You can't be timid or anything. And you come in here and everybody's aggressive and, you know, talking about fire stuff and -- just a different world than you normally see in the workplace.
>
> I Mm hm.
>
> S And if you can't adapt to that, it's really hard.
>
> I What's an example of being aggressive?
>
> S Um, well you have to stand up for yourself.
> *(Raymond, TL/Management, over five years with centre)*

Standing up for one's self did not necessarily mean arguing, although I was certain that it had been construed to mean this. Standing up for yourself also was saying clearly what you believed was important. For example, staff members stated their objections to how a faculty member handled a sexist comment by a student. Standing up may also have involved participating in the community meetings, even raising important questions.

The importance of community and trust in one another as well as in the organization seemed to be fostered by a number of different factors. Community was clearly oriented around the culture of fire fighting and training fire fighters. The CFET community also valued independence from other institutions and valued working together, particularly under pressure. The community also retained an impression that CFET was a family, stemming from its origins as a small tight-knit group overseen by a strong commander and reinforced by practices such as sharing meals during the lunch period and meeting regularly to discuss organizational concerns. Community and trust also were reinforced through connections people made through face-to-face encounters each day. Trust and accountability were valued highly by members. Perhaps one problematic aspect of the closeness of the organization was the sense that not everyone fit well with the organization. 'Outsiders' did not seem to be judged or isolated (except for the smokers who met in the back of the building during coffee break).

Change Process #1: Leaving Government

The most common descriptions of the culture of CFET referred to leaving government control. Leaving government represented a process in which the organizational culture changed. The process included a "birth experience," self-sufficiency and independence, upbeat morale, and a new name and corporate symbol for the organization.

Birth experience. One employee described leaving government as a birth experience because it was a new experience and the organization did not fully realize what would be involved.

> When we knew that we were going to be leaving the government, we were told that this would be a wonderful opportunity for us because we wouldn't have a lot of the red tape and the hurdles at this point and we would be flying under our own power. Which was great. I think everyone accepted that, including myself, but we really didn't understand what that really meant because even though we thought we weren't being all supported, there were a lot of associated responsibilities or tasks and support activities that government was doing for us and we had no idea how to do it when it was our turn to do it, right? So when we -- when the umbilical cord was cut, we found that we were on a huge learning curve at that point of understanding what it really took to run this organization. *(Jill, TL/Management, over ten years with centre)*

The learning challenges were simple and yet caused a drastic change. Management and staff indicated that they wanted to do things better, to be more organized, and to serve more clients. CFET management repeatedly promised that if persons did not agree with the move away from government and wanted to find a new position they would be supported by CFET until a new position was found. One manager did disagree believing that leaving government was a movement away from education and, as a result, sought other employment. Another manager was overwhelmed and experienced increased health problems that eventually caused him to return to his job as a faculty member rather than continue as a manager. A shared belief during this time period in the organization appeared to be confidence that the centre would be successful and could make a transition to a new corporate culture. In spite of the challenges, employees continued to work. The reasons why they continued varied from those who were near retirement and decided to remain to others who stayed because they wanted to see what would happen.

Self-sufficiency and independence. Another dimension of leaving government that was reflected in CFET combined self-sufficiency, competitiveness, and the independent nature of this community. These aspects were evident in the determination to succeed that could be found in a "show them" attitude toward government.

> We came from government and, as you know, government is traditional on being frivolous with their money and so it was easy to set an example -- well, we can do better than the government. That was another fostering that came down from Ian -- well, we were with government, now let's show them what we can do and I think we have shown them.
> *(Ken, Staff/Instructor, over five years with centre)*

The show them attitude may have been an attempt to facilitate the separation from the management style of government. By being able to point to ways in which the organization was being more efficient, staff were able to believe that they were doing things better than before.

Generally the reaction to the movement away from government to self-sufficiency and the resulting growth of the organizations was seen as positive by staff as illustrated in the following comment.

> Well, from a business perspective -- an identity perspective -- business perspective it's been great because when we were under the control of government, we could not expand or market or delivery -- in fact, we lost some potential excellent business because the government wouldn't let us go outside the province. *(Dave, TL/Management, over ten years with centre)*

This employee recognized that the government policy of limiting students to provincial employees limited the possibilities of growth. He measured the difference by the amount of new business opportunities that insured the success of the centre.

Upbeat morale. Most compelling in all the stories was the excitement that appeared to be generated by meeting the new challenges that faced the organization. One employee liked the organizational changes and compared working at CFET to her prior work experience.

> Yes. But I kind of like doing new things -- doing new things all the time makes your life -- it gives you the variety that I need to thrive. On the other hand, it makes me think 'damn, I wish I was 30 years younger', you know, because there's so many neat things happening in the business world that are stretching convention. When I first started working, the typical hierarchical structure with the boss at the top, sitting in the corner office, calling all the shots and all the employees jumping when he said so was very common. That's how businesses functioned. That's kind of how the college still functions. So, starting to work there was really no -- not much different in that aspect to what I had always been used to. To find a gem like this, buried out in a little town that half the people in the province don't even know exists, it's really (something special) -- I do things here just because of the attitude of the Board and Ian and their philosophy and that translated into vision, mission and values -- that some of my friends and former co-workers in my previous city, would just -- it would blow them away. *(Shirley, TL/Management, less than five years with centre)*

In this instance the employee does not stress the numerical growth. Instead she was impressed by the organizational philosophy and the possibilities created by the vision, mission, and values. These create for her a wish that she could start over after thirty years as well as a sense of satisfaction that something extraordinary was happening in an unexpected location.

A new member of the community recently hired had prior experience as a guest instructor at CFET. He reflected on the new attitude he saw at CFET.

> Government people have a tendency to live and survive but not prosper. Now I see that people that want to get ahead, see that there is a light down at the end of the tunnel -- there's some place they can go, and (they are) trying to figure out how to get there. *(Tim, TL/Management, less than five years with centre)*

From the point of view of this person the change from government was a journey toward prosperity. He seemed confident that staff was aware of the new possibilities for the organization even if it was not quite clear how to achieve the next step.

New name and corporate symbol. Leaving government and becoming a self-sustaining organization raised the issue of what the organization should be called. Following research conducted by a marketing company and consultation during community meetings of staff and management, CFET chose a new name, a new corporate logo, and changed from military uniforms to a corporate casual dress code. Ownership of the new name and logo was very high.

> It [the name change] didn't bother me -- I didn't have -- you know, some people had a real problem when we left government 'cause they felt that sort of tie to government -- for God's sake, who cares -- I never really had that loyalty, I guess, to [government] –[the name] change to CFET, I thought it was cool, it was exciting, loved the logo, liked what it symbolized -- we were, um, becoming more like an organization that would become global because we're not tied to a specific province, country, that kind of thing…Yes, that we like the new corporate wear. It's better than the military uniforms…this is better.
> *(Barbara, TL/Management, over ten years with centre)*

The corporate wear represented a significant shift from the previous military uniform to "corporate casual" dress, and seemed to be well received. The cultural identity no longer reflected that of a provincial program, but of a program that was expanding its boundaries: not tied to the province, but becoming national, even international.

Leaving government seemed to result in a new identity in the organization that, in retrospect, mirrored a life cycle type of transformation. The different aspects of moving from government included a birth experience, self-sufficiency and independence, and changes toward a new corporate identity. As a result the organization seemed to look forward with the awareness that the centre could attract and sustain business from other provinces and even other countries. Such confidence added excitement and fueled a determination to seek out relationships with new partners.

Change Process #2: A Community in the Midst of Change

It is important to note that CFET had undergone significant change in the past few years. Participants in this study reported several changes that were significant in that they involved multiple departments and a majority of staff. These changes included changing to an entrepreneurial culture, a change in job evaluations, the inclusion of women fire fighters and instructors, increasing activity, and a greater sense of empowerment.

Changing to an entrepreneurial culture. Prior to 1997 CFET was a secure government agency funded solely through government support. CFET provided services to municipal fire firefighters, and these municipalities provided a steady stream of students. Even though some thought the firefighting centre to be "the best kept secret in the province" there were no attempts to change the mandate and expand services to another province or to private industry.

During the early 1990's the province reduced the provincial budget by making drastic cuts in such core services as health care and education and by privatizing other services such as registry and liquor stores. CFET was shuffled between government departments during this time. Initially CFET was operated within the Fire Commissioner's office. Later it was moved to the Department of Labor. When Labor was reorganized to become the Department of Human Resources CFET was moved to the Department of Municipal Affairs. Finally, to accommodate the most recent change CFET was sold to a community college for $1.00 and told to be a self-sustaining organization. Because the local community college was accountable to the provincial Department of Learning, CFET came under a new government department.

Since the government decision in 1997, which essentially privatized the provincial firefighting centre, the organization actively sought to become a business or entrepreneurial culture. Transforming the culture required the involvement, negotiation, and ownership of the CFET staff. A pivotal figure in the transformation appeared to be the commanding officer. He entered into an MBA degree program and used his thesis to initiate activities and involve staff in processes assisting the organization to transform the organizational culture. He believed that his study was central in planning a new corporate culture emphasizing cooperation, professional conduct, and accountability, and restructuring the organization into self-directed teams. Although the CEO was a central figure, staff members were actively involved in determining the future of the organization as they met to decide and write statements about the vision, mission, and values of the organization. I observed the results of these efforts to transform the culture in artifacts that hung on the wall in the conference room such as a net representing the new organizational structure and posters showing the mission and value statements of the organizations, interviewee's appreciative comments that they had participated in the cultural transformation process, community meetings, small group planning sessions, and the annual plenary Christmas Meetings.

Staff viewed their engagement in the cultural transformation, particularly in the written mission and value statements as truly collaborative. One woman commented.

> I think that it was -- when we did the cultural statements and we outlined those cultural statements, I think it came out of there -- if I remember correctly, that would have been -- well, last year is when the Christmas Meeting is when we finalized those cultural statements and said 'here they are' and we had already started doing some of that though, we'd already, um, started some of the -- some of the training and I think it was just the organizational change -- I think we just had -- just had began -- and then those things fell out of that because, I mean, in order for us to be able to

> understand each other and to be able to communicate more effectively, etc., then we needed some kind of tools to be (effective) how can you expect people to just overnight, here you are, there I want you to be -- I want you to reflect these values and these goals and, you know, just do it. But you need to have that training and so that sort of fell out of there, so I don't think it was -- I don't see it being dictated from the top down. I think it was collaboration. *(Jesse, Staff/Instructors, over five years with centre)*

Collaboration in this case meant that the staff worked together to achieve a common understanding. The documents were not imposed on persons by a hierarchy, and instead seemed to grow out of the common work together. These documents, adopted in January of 2002, perhaps marked the end of the beginning of the organization. By this I mean that the development of the mission, vision, and values and the engagement in the new name and logo as well as the change process launched the new organization thus ending the beginning period. Sustaining the new organization represented the next challenge.

Job evaluations. One particular change, job evaluations, was representative of the cultural change at CFET. Prior to 1997 almost all of the staff were instructors. Annual evaluations were made by the commander who considered such things as length of service and education specialties such as hazardous materials to assign pay increases and pay scales. This approach was sufficient for a staff made up mostly of instructors, but as the number of non-instructor staff increased a different means of evaluation was needed to be equitable to those staff that were not instructors. A new evaluation procedure was initiated that based annual evaluations not only on an individual's education, but added two additional measures: peer assessment about team participation, and job performance goals agreed between an employee and a manager. Although the pay scales between instructors, curriculum design, administration, finance, and technicians were not equal in terms of actual dollars (instructors and course developers were the highest pay scale), the new evaluation process was perceived as fair and based on what an individual contributed to the organization. One of the staff commented.

> S It took about two and a half years overall but we came up with an evaluation system for our Staff Association members that puts them in a position to immediately know what their strengths and weaknesses are and gives them a very clear path of what they must do to get to the top end of the scale. And people who are comfortable with what they do, like doing what they do, don't ever want to do anything different, can look at that evaluation form and say 'I don't care about this stuff up here -- I like my fit right here and I'm not changing'. That's their choice, but for the people that are more career-oriented or goal-oriented or want different things, it's laid out very clearly. There are three elements to it and you're categorized within each element and then the whole thing is averaged together and that's where it plunks you on the scale, and if you're in the middle, there's three areas where you can look to the right and say 'okay, if I want or need more money, this is what I have to do' and...
>
> I So it's a pretty fair system, as far as you're concerned.
>
> S Mm hm. You get rewarded for your learning and some people are not learners -- they're quite content to plod away at what they've got... *(Shirley, TL/Management, two years with centre)*

In the past, education and attendance at continuing educational courses was the distinguishing feature of the pay scale, a factor that favoured faculty over other staff. The new evaluation process seemed to be more equitable in that in addition to one's educational background and experience, the measures of evaluation also included actual working relationships and individual contributions to meeting overall organizational goals. The impact of this seemed to equitably reward all staff.

Inclusion of women. A cultural change regarding opportunities for women also impacted the Centre for Fire and Emergency Training. Traditionally fire fighting has been restricted to men, and the centre reflected this custom. Prior to 1990 the faculty were all male. At the time of my study there were two women instructors, but neither of them were directly involved in teaching. Shortly before my field observation ended a female instructor was hired. Overall more women than men were employed at the centre and a clear division of labor appeared to exist in the organization. Although women were team leaders in finance, registration, and business development, all of the administrative support positions in finance, registration, and curriculum design were women. Interestingly, the two female instructors were involved in business development and visited clients to determine needs and create course contracts. One of these women was referred to as an example of the shift toward the entrepreneurial attitude at CFET because she had identified a new market and developed a business plan for marketing emergency courses in risk management and disaster planning. During my visit I observed both men and women preparing to represent the firefighting centre at career fairs, but most often a woman from the business development department and a woman responsible for distance learning staffed the booths at career fairs.

At the time of my study only men were employed as technicians or instructors. Senior management at the time I observed also were all male. However, because one senior manager was sometimes absent a woman from his department often represented the manager at the Network Bridging Team meetings. I noted that there was always at least one woman in addition to the executive assistant who participated in these meetings.

Two women currently in the organization entered the organization as instructors and were involved in business development at the time of my study. One woman described her role in the organization.

> I seem to be breaking a lot of ice here as I'm going along -- like, ever since I started at the firefighting centre -- first of all, being female in the fire service, you know, it's still not that common and we still get resistance, so being an EST (Emergency Service Technician) student and being one of the first females or the first female in the EST program --

> actually, there was another girl in that -- native female, I might add to that, was breaking new ground.
> *(Winnie, Staff/Instructor, seven years with centre)*

During the conversation the speaker did not expound on the resistance that she experienced. She explained instead that the experience of breaking new ground, not only as a woman instructor in emergency services but also a member of a minority, was a draining experience. She revealed that she believed that she was a shy person and didn't like being in front of people and explained that she felt odd as an "introvert" working among a lot of "extroverts". My perception was that the resistance she encountered was two fold. One aspect of the "draining experience" may well have been resistance in the fire industry to her status as a knowledgeable expert in the field. A second explanation of "draining" may have been internal, an inner thought or feeling about her adequacy. In this respect, her response focused on proving that she was knowledgeable about the market she was developing in safety and risk management. I can only begin to imagine how this experience was draining, but it seems reasonable to assume that the energy required to meet the public and personal expectations was significant.

CFET had also developed a gender-neutral promotional brochure showing two identically dressed fire fighters, one male and one female. These pictures also were on the binder covers used for course materials, part of an organizational 'branding' campaign that included a new logo, new organizational name, and change from the military uniforms to casual corporate dress. However, while the logo was positively received, the male/female pictures were controversial. For example, during an afternoon coffee break I witnessed the following conversation between one instructor and some women staff members. He shared to them that when he handed out the binders at the beginning of a class, one student pushed the binder away and said, "I'm not studying from this book". The instructor explained that rather than confronting the student, he chose to get another binder, this one with the male on the cover. The two women staff members immediately confronted him saying, "That's bullshit! In today's world no one should be allowed to do that!" The faculty member answered that one of the women instructors had a similar problem in teaching classes and intentionally selected the male cover binders, but his answer was criticized as an unacceptable way to teach. He argued that selecting the male-picture covers was a practice used in many off site settings, particularly rural areas.

Another example of response to gender issues occurred at the 2003 Christmas meetings. It was the third morning of the week and the focus was on decision-making tools. A variety of examples were shown such as an affinity tool, a force field analysis, a cause and effect scheme, and a criteria-based matrix. Throughout the week I was counting the number of persons who spoke out in the large community discussion. At 11:10 AM as the force field analysis tools were being discussed a women administrative staff member suggested that they discuss communication since it had already been mentioned several times during the week. During the brief discussion seven women spoke out. They offered examples of what influenced communication in the group, noting that people didn't speak out if it was hard to defend or if they were given too much information. They also described how communication could be improved, pointing out that in developing solutions the right people had to be in the room at the time. However, the discussion ended quickly without resolution or further steps being planned, and the topic turned back to decision-making tools.

The next model discussed was a cause and effect model, a strikingly linear model with lines connecting boxes, labeled people, systems, procedures, and policies. The discussion centered on decisions made about the broken pipes that occurred during the summer of 2002, and involved male instructors: only one woman spoke.

I thought these two examples were noteworthy for a number of reasons. One gendered stereotype suggests that men are more comfortable talking about things while women are more comfortable talking about relationships. These two brief discussions appeared to illustrate that difference. However, several observations go beneath this stereotype. The seven persons who became engaged in the discussion about communication did not speak out again during that morning. Different speakers noted the importance of communication for the organization at different presentations throughout the five days of meetings. Usually the responsibility for knowing was placed on the individual who was told to put the information in an email, or to be sure to take responsibility for reading their email. However, no one mentioned or referred to these seven persons who obviously had something to say about communication. Perhaps, had more time been available or if a facilitator had been present to lead a discussion drawing out what persons thought or felt about the comments of these seven, the organization could have taken greater learning from this spontaneous event. Based on the view of organizational learning argued in this study it seems that the communication skills and ideas of the seven persons who spoke had not circulated in this organization and as a result the organization had not learned how to incorporate the existing knowledge.

Increasing activity. Prior to 1997, the program at CFET was fixed and had a predictable rhythm. Courses were taught to municipal fire fighters and officers in eleven week sessions held between April to July and August to October each year. Growth in CFET staff was minimal and staff turnover was low. Such continuity fostered long-term relationships and helped the CFET culture to retain the sense of a family. Growth that occurred prior to 1997 was slow but steady. For example, in 1980 the firefighting centre employed three persons: a commander, one administrative support person, and one instructor. By 1990 the firefighting center employed fourteen persons: ten instructors, three administrative support staff, and one commander. Since 1990 the number of staff increased from fourteen to forty-five in 2002. In 1997 there were three managers: a CEO, the director of curriculum and the director of operations. There were five senior managers in 2002: the CEO, a vice-president of business development, a vice-president of finance, a Chief Operating Officer (COO), and the director of curriculum. Increased staff members were added to the Finance, Registrar, and Technician teams, but the greatest increase was technicians.

Although many of the persons interviewed expressed the thought that they liked their job and the work environment, many also talked about the increased workload that they had experienced due partly to increased student numbers and increased requirements for building and ground maintenance. The volume of activity meant that there were more bills to pay, more student certificates to prepare, or more phone calls to return. The different changes also required employees to learn to use new software programs. For example the accounting software changed three times between 1997-2001. The most recent change occurred during the summer and fall of 2002 CFET. Staff learned People Soft, a new accounting software program, and in some cases this change doubled work activity. Not only were staff expected to use the program to register new students, but the change also required staff to re-enter continuing students.

Perhaps the greatest impact, according to those interviewed, was that student registrations increased. Prior to 1997 enrollment at CFET was restricted to firefighters employed in the province. An initial impact of reduced government control was that the prior employment requirement was discontinued, enabling CFET to accept all applicants including students from outside the province. Since 1997 CFET had grown from four thousand students to over nine thousand students registered in 2002. The increase in the number of student multiplied the demands on normal routines. For example, previously each instructor scheduled fire trucks by the week even if the actual field simulations were only on one or two days of the week. Resolving the scheduling difficulties was one of the key organizational learning innovations and is discussed in the next chapter.

For the organization the predictable and stable environment became unpredictable and varied. One of the first women instructors described the evolution from the fixed setting that was known and perhaps taken for granted to the current setting in which there was a variety of services.

> (When I first started) We had one diligent instructor who I remember coming on board and he had this binder and in this binder he had every course and everything from pencils to number of erasers to number of pieces of paper listed for every course and I thought -- as a new member, I thought this was wonderful because this is my little bible, right? Then after a couple of years, we all knew it all. We knew it all. So, this poor one instructor kept saying 'Well, no one's updating this (binder). And I said 'yeah, yeah, who cares', right, we know it." So that got lost. Now, it's needed again because not everybody knows and we're finding inconsistencies, right, in how it's being – [in how] things are being delivered. *(Jill, TL/Management, over ten years with centre)*

The course binder was a guidebook that assured course consistency for the faculty. It was a reliable and trusted resource: in her words, a Bible. The new changes in curriculum design altered the routines previously taken for granted. As a result she believed that there was inconsistency. For example, course materials varied depending on the teaching location and the different modular combinations. On one occasion a course instructor brought a rope, used at the fire fighting centre in a search and rescue training course, to an offsite location, only to learn that it was too short for the off site location. Because there was increased need to adapt to new situations, it seemed that there was increased opportunity for confusion.

Greater sense of empowerment. In spite of the fact that CFET was in the midst of change the morale of the employees seemed to be positive and excited. Although faced with numerous issues that could have resulted in ongoing conflicts, the organization had adapted to these without much pettiness or disagreement. In fact staff had managed to push forward and embrace change to the point of referring to the centre as "Change R Us". The upbeat attitude seemed to be at least partly due to transparency on the part of the CEO who kept staff informed and engaged in the ongoing changes. What impressed me were the different ways that persons coped with the time constraints. One person, a technician responsible for ongoing maintenance, simply accepted that there were always unexpected things that happened everyday. Rather than trying to plan for these events, he tried to accept them. Another person developed her own internal management system for contracts. Rather than continuing to go to files to look up dates of courses contracted or the materials needed, she developed a chart of the upcoming contracts that included answers to these commonly asked questions.

Staff participated in substantial aspects of the organizational change process, and, as noted previously, was involved in choosing the new corporate name and logo as well as writing the current vision, mission, and values statements. The end result was an organization seemingly willing to embrace change because they had been engaged in designing the new direction of the organization. One instructor summed up his experience in the organization in the following words.

> Um, I think the biggest thing in our culture is empowerment -- what people are and (how) they can make on decisions on their own, they're empowered to make decisions on their own or given permission to do that. The other thing is the managers will, you know, may not necessarily agree with the decision that was made at the time, but will back them on that -- I mean, okay, in the future you will do this; however, for this case here we will honour the decision that you made. I think the level of communication here in the organization is second to none. It's not 100% but I mean it's very good. *(Stephen, Staff/Instructor, over five years with centre)*

What seemed to be valued and important was that persons felt they were contributing something worthwhile to the organization and were in turn gaining something, be it personal support or maturity and growth from the process.

Summary and Discussion: Cultural Impact on Organizational Learning

The culture of CFET was important providing both continuity and the capacity to adapt to the many different learning challenges that CFET faced. These aspects are discussed here in terms of questions that help to distinguish the contribution made by the organization's culture to organizational learning.

What are the unique foundations of the culture? The unique aspects of the culture included the close bonding of those in the community, the ability to pull together during crisis, and the upbeat attitude of self-sufficiency that was willing to take on difficult challenges. CFET also seemed unique in the capacity it had achieved to support and recognize individual achievements and accomplishments, while maintaining the awareness of a united organization willing to compete in an entrepreneurial culture.

What are the most significant changes to the culture? Significant changes in the organizational culture were those that threatened the continuity of the culture of the organization. Clearly one of these changes was leaving government. Leaving government involved a threat to the culture, but not because the ongoing survival of the centre was questioned. Instead leaving government raised the question of whether or not the cultural foundations of fire fighting and the close family community would continue in the new entrepreneurial organization.

Another significant change in the culture was the impact made by the inclusion of women as instructors and as staff members. As noted previously, because CFET was closely linked to fire fighters the masculine aspects of aggressiveness and the exclusion of women were significant barriers to including women. The inclusion of women as instructors and as staff required the organization to learn to include women in on-going practices including teaching, job evaluation procedures, and formulating the mission and goals of the organization.

What remains constant in the culture despite the change? CFET was able to make the necessary adjustments and compromises required to shift to an entrepreneurial culture and to include women because of ongoing cultural constants. The cultural constants that seemed to remain despite change included the ability of the organization to work together to resolve crisis, the involvement of persons in playful daily interactions, and the willingness to maintain ongoing conversations that did not isolate or divide into special interests. Because the constant daily interactions brought members of the organization into dialogue with one another the organization seemed able to continue through change. Another cultural constant was CFET's ability to care for one another and to express concern for individuals, which seemed to help persons to feel accepted and valued by the organization. Also related to this care and concern was the access that staff had to leadership, who seemed to be open to discussing and supporting personal issues. Because of the care and concern that was expressed persons seemed to be willing to accept compromises and trusted that leadership would not harm the members.

From an organizational learning lens how do the changes occur? An organizational learning lens focuses on "whatever work people in the organization do together" (Yanow, 2000, p. 258). Using such a lens to understand how change occurred would focus on what the community knows, the interactive processes used, the physical artifacts that were important, and the language used. Since a significant change was leaving government and becoming an entrepreneurial culture, an organizational learning lens would see that changes were accomplished in activities such as the community meetings that discussed and decided the new corporate name and corporate logo, the meetings between individuals and small groups that discussed work problems over morning coffee, or when different departments met to design a new workshop or course.

The learning that occurred in these meetings no doubt also contributed to how the organization was learning to include women. However, in addition to the community meetings the daily interactions in which women not only shared, but also became full participants in the daily work, arguments, and humor were important ways in which the organization learned to include women.

What cultural constants seem to support learning and change? The cultural constant that supported learning and change seemed to link with the foundations of the organizational culture and the problems that needed to be resolved. For example, the willingness to pull together in a crisis seems to stem from the bedrock foundation built on the close knit bonds of a family of fire fighters, and was evident at CFET in such cultural constants as trust in community and the care and concern for each other. However, the link to solving problems was also critical because these constants helped CFET to embrace the changes it faced. The cultural constants that helped the community to resolve differences included playfulness and empowerment. These constants were helpful because they reduced tensions, helped to maintain the community identity, and encouraged persons to continue working in the face of increasing work pressures.

What were the conflicts and tensions? Although CFET seemed to have managed a successful shift in changing the corporate culture, cultural tensions continue. The close knit nature of the community based in the fire fighting culture as well as the trust, care, and concern expressed at CFET were challenged by the aggressiveness and masculinity that was also present in the community. The aggressiveness could have threatened new staff and certainly presented an ongoing challenge for new staff members. The fact that some staff look out for instances in which the aggressive nature might harm persons and act as a kind of referee suggested that conflict and tension occurred.

Another tension was the strain that seemed to exist between the history and desire to remain a close bonded and caring community that pulled together and the demands created by the growth and departmentalization of the organization. During my study I learned of conflict between instructors and marketing, and I noted previously some of my questions about how the organization will learn to recognize and incorporate the knowledge of women who work in the administrative staff.

These points of tensions were serious but CFET seemed to be able to bridge the tension. However, it was not clear how the CFET culture bridged with other organizations. For example, the fire fighting and close-knit family foundation at CFET might become problematic in the ongoing relationship with the community college. The college culture was decidedly not fire fighters nor did it share the close family bonds evident at CFET. Since CFET is legally a subsidiary of the college organizational tensions between these two organizations may occur in the future because the cultures do not share similar foundations. This lack of a similar foundation, coupled with the observation that the learning ability of CFET seemed to occur in the internal activity and relationships may not serve CFET well in building bridges with the community college.

Yanow (2000) explained that organizational culture could be used to study organizational learning by focusing on the collective and its situated acts in artifacts of daily work related practices including how knowledge was understood and how change was accomplished. This ethnographic portrait used organizational culture to understand the conditions and processes fostering organizational learning. CFET culture enabled learning by providing continuity of the essential aspects of identity and self-understanding of CFET members and sustaining the ongoing practices that supported the change necessary in the organization.

CHAPTER FIVE

INNOVATION AND ORGANIZATION LEARNING

The preceding chapter explained the CFET culture, how changes to culture involved learning, and discussed how the existing culture helped sustain the organization through the disequilibrium and conflict caused by the external changes and the internal learning. However, there were differences in the work experiences of the employees. Different work experiences could lead to isolation between departments, often described as "silos." Although culture helped OL at CFET, management and staff faced the challenge of learning how to work collectively across the different groups. These challenges were met by developing innovations that impacted how decisions were made, how equipment was scheduled, how students were registered, and how instruction was provided. In this chapter, I briefly describe the criteria used to select these innovations. Second, I present evidence illustrating the need for the organization to learn how to work collectively across groups. Three innovations developed at CFET have been selected for analysis to understand the organizational learning processes they embedded: developing a new operational structure as coordinated teams, developing the capacity to organize services, and developing a modular curriculum.

I used three criteria to select these innovations. The first criterion was how often the innovation was mentioned as a critical learning event during interviews. A second criterion was a judgment I made as to whether or not the innovation required new learning in the organization, which I assumed was learning that included each department of the organization. A third criterion was whether or not there seemed to be a relationship between new learning and changing practices in the organization. For example, leaving government was considered an important cultural theme, but was not an innovation that required organizational learning because it did not meet this third criterion. However, developing coordinated teams was considered an innovation because it was frequently mentioned, impacted each department, and specifically related to new practices in the organization. Similarly developing a modular curriculum design was considered an innovation that required organizational learning because it met the three criteria for selection. Changes in teaching styles, however, was not selected as an innovation because it was seldom mentioned, impacted only one department, and did not seem to have a significant relationship to practices in the rest of the organization.

An OL Issue: Understanding the Different Interpretations of a Client's Need

Awareness about anticipating the client need and the importance of meeting the need was one way that the organization's learning was challenged after moving away from government control. A staff member commented,

> Well, just -- I think, in this day and age, like to survive in business now, you have to be really agile and if the client wants something, you have to provide it -- you can't just say 'no we can't provide it 'cause we can't do this'. We have to adapt to be able to -- you know, we have to change to meet their needs. *(Raymond, TL/Management, over five years with centre)*

Individuals in the organization had a strong desire to meet client needs. Some client needs were met as persons adapted to requests. For example, in response to student requests for ritualized "graduation" celebrations, two instructors adapted and created an informal closing ritual that included designing group t-shirts and an informal process in which a fire helmet was signed by each student and hung on a wall in the student lounge area. This example represented a focus on customer need expressed by faculty, but it did not seem to be OL because the learning did not impact all of the departments in the organization. However, learning to deal with different interpretations of a client need was important for the organization and required learning to work collectively across the different groups.

There were at least four different viewpoints on a client need. The NBT, the management view, used the term "dashboard" to describe a client need. A dashboard view was a check of the relationship in several key areas such as the size and current status of a contract. For the Network Bridging Team it was important to have a person assigned to be a contact with the client.

> Notes Dec. 4, 2003: Who is the Account Manager for Edmonton—Should Jill be handling this or is Gary the one? Where are we with the overall relationship? Jill needs to know that,

In this case even though knowledge content was important the critical issue was managing the continuing relationship with the client. The relationship was important to the NBT because it was the means for them to understand the client's current status and to anticipate future needs.

The Registrar's view differed from the NBT as to what constituted a client's need, and focused on assuring that the certification requirements were met. During the Christmas meetings I attended a meeting between the Registrar and her staff and the instructors. This meeting was held to explain the administrative issues that were related to managing test preparation and scoring as well as registration. Rather than a personal relationship with the client the Office of the Registrar saw the client need as having a certificate that indicated that the course was completed successfully. For the Registrar, certification of participation was dependent on CFET faculty providing the Registrar's office with the necessary documentation of course rosters by a Tuesday deadline necessary for staff in the Registrar's office to prepare and verify the appropriate certification materials. Learning occurred in sharing with the instructors the Registrar's routines and procedures that were required to verify tuition and contract payments, grade tests, and provide documentation for students.

Another perspective of client need was expressed from the viewpoint of the technicians. In the following quote a team leader described the client need as the tension between the need to maintain equipment and the urgency to keep the water pumps working to provide water for the firefighting field exercises.

> S Um, well we're stretched pretty good anyway -- um, where are we -- just -- I guess just manpower-wise… Ian's pretty tight on hiring people -- tech services, the tech services facilities has grown so much -- like, he's given us everything in here and we just don't have the staff to deal with it all -- we have to send stuff out all the time to get fixed and -- and when things are really booming around here, they're breaking things faster than we can fix them so that's where we're stretched I guess.
>
> I Yeah. Yeah, so, if a pump breaks or, you know, a truck breaks down or something, those are things that -- there's a back-up log...
>
> S Yeah. Like, they're our priority but then they're -- like the breathing apparatus are breaking down and next thing (that happens may be) the props and -- just the water system -- like, we had all those water system breaks (last summer) and -- that's where we're stretched -- just in manpower. *(Raymond, TL/Management, over five years with centre)*

Technicians seemed to be concerned less with relationships or certification, but focused on ensuring that the technical facilities and equipment for client services were operational.

Instructors seemed to share a fourth perspective of a client need, and focused on the quality of the course material as well as having the necessary equipment available for course instruction.

> S No, we're -- we have a fairly dedicated staff, right from -- right from our receptionist, course development, facilities management -- all of us, we're all dedicated to our functions and making sure that we give a top quality product. *(Dave, TL/Management, over ten years with centre)*

Another employee also commented on the different perspectives involved.

> S ...certain trucks work better on certain courses, it's not just necessarily a truck -- I might need a certain truck because it's got a particular piece of equipment on it that I need for that program, so then there's all those headaches and it's still evolving. We are still trying to fine-tune that system. *(Stephen, Staff/Instructor, over five years with centre)*

Instructors seemed focused on the quality of the course material and having the appropriate teaching props for practical instruction in the field. Such a concern with course materials no doubt was also related to student evaluations that were completed for each course. If course exams contained typographical errors or if course materials were not available when needed, some instructors believed that it resulted in a drop in the course satisfaction. One instructor valued the personal relationships with students and chose to celebrate the end of term by inviting students to his home for an end of term cookout. It seemed that faculty tended to view the client relationship through the eye of how well the student was satisfied with the instruction and course material rather than the more abstract corporate client satisfaction.

Stepping back from these examples it appears that learning from these different interpretations of a client need required collective learning at CFET. The NBT perceived the client need in terms of how well the system was functioning. The NBT wanted to know how the overall relationship was managed. Even though individual relationships were important, the concern was with an overall satisfaction. Technicians and the Registrar perceived a similar overall concern of satisfying the client but did so by providing the necessary support infrastructure. Instructors met with individual students and wanted to provide quality education and safe practices. Again drawing on actor network theory, achieving an acceptable level of client satisfaction suggests that CFET and its different parts are aligned with a client. Any single failure to align such as an instructor arriving on the wrong day to deliver a course or the misplacing of a student's course registration may cause a client relationship to deteriorate. A series of misalignments of these different perspectives could raise questions about the ability of CFET to consistently meet client needs. Thus, OL will include the continuous sharing of feedback through varied processes including transmission, clarification, and negotiation. These negotiations represent opportunities as well as practices of organizational learning.

The flow of information related to the different interpretations of a client need was a critical aspect of OL at CFET. Although there seemed to be a common understanding that meeting a client need meant that a client was satisfied, the organization had just begun to manage the diversity of opinions that constituted the meaning of client need. To work collectively across groups the organization developed three innovations.

The three innovations resolved problems by working collectively across work-based differences. Each of the innovations involved the creation of new knowledge that became integrated within the ongoing activity of CFET. As I argue in this chapter, it appeared that in the emergence of each innovation, networks consisting of both people and objects were mobilized to participate in the process of organizational learning. The knowledge creating activity appeared to be multi-leveled and dynamic, nested in relationships that involved humans, objects, language, and financial resources. The learning process itself could be described more as a recursive circulation of knowledge among these elements rather than the conventional linear notion of an idea that was developed, implemented, and integrated. Finally, the organizational learning connected with innovation occurred over a period of time and involved learning across work-based differences including conflicts, activities, and modifications.

Developing Coordinated Teams

Learning to function as coordinated teams was a critical learning event for members of the CFET organization. Fifteen of the twenty persons interviewed made forty-six references to learning to function as coordinated teams. It involved changing assumptions about decision-making in the organization, recognizing new interconnected practices, and developing improved practices of communication.

Learning to become coordinated teams had proven difficult for CFET. Prior to 1997 the commander of the Centre for Fire and Emergency Training gave orders that flowed down a hierarchical organizational structure. In 1997 management attempted to flatten the pyramid organizational structure by establishing team leaders in the different areas of finance, maintenance, instruction, registrar, and business development. Each manager was given a budget and was responsible for financial decisions for his or her respective budget allocation. However, the efforts to flatten decision-making were frustrated by the status quo of the organizational culture. Staff, for example, continued to wear paramilitary uniforms with specific indicators of rank and role. The number of stripes indicated rank in the organization. Role was indicated by the color. Gold lettering designated the operational management and faculty. Maroon lettering demarcated administrative staff. At that time management and faculty represented eleven of the thirteen full time positions at CFET. In addition, although team leaders had responsibility for budget expenditures, the central budget allocation remained in the executive office. As a result despite the efforts of individuals to build coordinated teams the organization remained tied to the hierarchical model. A key new organizational learning challenge was nurturing self-empowerment in the coordinated teams.

Changing assumptions about decision-making. Learning to function as self-empowered teams was an innovation at CFET that changed basic assumptions about how staff interacted. Perhaps the most difficult challenge was changing the assumption about decision-making. Previously information was centralized and decisions were made in the commander's office, but the shift to coordinated teams involved staff directly in decisions related to identifying, managing, and providing client services. Organizational learning was required when the flattened management structure emphasized decision-making by coordinated teams.

During a visit with the Marketing Department assistant and team leader, they shared an example illustrating the flattened management structure for decision-making. Marketing was asked by a local long-term healthcare facility to develop and provide training for staff in emergency evacuation techniques. These two persons described the process in which they began to identify, manage, and provide direct client services. After learning the needs of the client, Marketing brought together a CFET team representing operations, curriculum design, and faculty to discuss the idea and develop a workshop. Bringing these persons together in a planning and development activity was an example of innovation because this team was acting in a new way with their client. Working together the inter-department team developed a training module that provided an emergency evacuation plan, education, actual experience in using fire extinguishers, and practice in carrying and moving patients. Following positive feedback about the success of this workshop, Marketing began exploring interest from other long-term care providers for this type of workshop.

The workshop program was the result of learning to function as coordinated teams. The central office may have been informed about the decision during a regularly scheduled meeting of senior management, but was not involved in the decision to develop the plan or workshop. Instead the coordinated team functioned as the decision-maker for the organization. Their decision to provide the workshop to the health care agency was not simply adding a new client, but also enabling the organization to increase capacity by combining the diverse skills of CFET in fire fighting in a new arrangement to provide emergency preparedness training for a health care centre.

Changing assumptions about decision-making also involved learning across departments. In this example the Marketing department provided the initial impetus, or problematization, that formed a workshop-building network. Marketing was able to enroll varied entities including instructors, curriculum designers, technicians, existing training courses, and fire extinguishers. Also, in this case a successful translation occurred that translated traditional fire fighting procedures to emergency evacuation, which differed from fire fighting in several ways. For example, the project was training nurses and other health care workers not fire fighters. Rescue and fire fighting were not the primary focus. Instead the training focused on evacuation procedures and involved working with a client to develop an evacuation plan, providing experience in using fire extinguishers, and instruction and practice in lifting and carrying patients.

Several OL factors helped to align and stabilize the network that formed around the problem of designing a new emergency evacuation workshop for health care workers. One OL factor was the mission of the organization, which sought to provide sustainable solutions in emergency services training and risk management, customer intimacy, and balanced accountability between people, environment, and economics[2]. OL occurred as the meaning of these statements were negotiated at different nodes in the network as different actors in the network became engaged in aspects of planning and adapting the different skills and artifacts. This process of negotiation appears to present an important aspect of organizational learning.

An essential but problematic aspect of the shift in decision-making within a coordinated team structure was the movement of knowledge between the teams. The movement of knowledge enabled each person to recognize how he or she was accountable to one another in the flattened network. However, even though each manager, team leader, and member of the department was interrelated, a cycle of continuous negotiation appeared to be necessary. The cycle of negotiation coupled with the change in decision-making seemed to blur the traditional lines of responsibility and required a new emphasis on understanding the effect of decision-making. A woman from Marketing commented.

> Okay. Organizational and I guess maybe I skip forward a little bit, what I'm seeing right now is this organization is blurred minds of responsibility; meaning, when does -- if a department's tasked with a project, understanding that their decision will have a ripple effect throughout the organization and who's really spearheading, who is really responsible for gathering that information and making those decisions and then communicating that information out. I'm finding that those are very blurred lines right now and that's, I think, a most recent critical hurdle that we're encountering right now because of the departments have grown in

[2] Mission Statement Centre for Fire and Emergency Training

> size and we don't have that tight understanding of what everybody's doing -- we're all basically little silos now, doing what we're supposed to do but we don't understand the effects of our decision-making or responsibility to the other departments in decision-making. *(Jill, TL/Management, over ten years with centre)*

The reference to "blurred minds" may be an unconscious mistake, but interesting in what it reveals. When she initially referred to the problem as blurred minds of accountability, and then later described the issues as blurred lines of accountability, this woman represented the kind of knowledge creating activity that was occurring in the organization. Her first view, "blurred minds", pointed out the need for each person to have an awareness that doing one's job also involved understanding the jobs of others and the possible impact one had on others. Her concern that persons in the organization might act without awareness of how they impacted others was significant because her insight pointed to organizational learning processes found in relationships.

The comments below also seem to agree that awareness was needed. The speaker had over ten years with the organization starting initially as a student intern from the community college. She had seen the organization grow from a staff of three to its present size of almost fifty staff.

> I What are the practices that, you know, the organization is sort of learning as it is dealing with this new change?
>
> S Um, if you do something, you are in -- whether you mean to or not, you are going to affect somebody else which you may or may not have even thought (were) party to that decision. Um, so it's really forcing us to take a look at what we do and try to envision who else is impacted by the decision and to hold more meetings, um, to communicate that sort of transition or change that we're about to embark upon. I know there's always been the jokes about oh yeah, another meeting but it's -- those comments are becoming less and less and we're beginning to see the value of why it is important to meet and to discuss, you know, the plans of one area even and, okay, we're planning to do this, how does this impact everybody else. It's created an awareness -- awareness of who we are and

who we impact internally...*(Barbara, TL/Management, over ten years with centre)*

Here the speaker acknowledged that awareness of how individual actions impacted others was important. Because the OL activity involved a shift toward different assumptions about decision-making she concluded that awareness was needed. Awareness seems to be an indication of the deutero level of organizational learning (Argyris, 1978) because such awareness related to all other aspects of the organization. Differences between knowledge creating activity and deutero-learning will be discussed in the next chapter.

In changing assumptions about decision-making, CFET has been engaged in OL as knowledge creating activity. The conditions that fostered learning included new information, forming new networks, and continuous circulation of knowledge. The organizational learning that occurred as persons were engaged in designing the health care training workshop was an example of OL changes in decision-making. The innovation was a coordinated team; the network formed as the team was mobilized. Learning moved as the project idea was shaped into a workshop. Some insight can be gained as to what this movement was like. First, it seems that movement translated existing course materials about fire fighting to fit a different type of client and situation. Also, persons became energized in designing and implementing the new course, which I assume required negotiation and agreement as to the value and transportability of the information.

The pilot project to plan and deliver an emergency service workshop seemed to be indicative of how the coordinated teams were working together in other matters. The Marketing team leader indicated how the circulation of OL shaped the team. When she expressed her comment about "blurred minds" it did not seem that the woman from

Marketing wanted persons to be familiar with the job descriptions of other staff. Instead she wanted persons "to understand the effects of our decision-making". Understanding the effects of decision-making linked individuals into a collective learning. Both the women seemed most interested in collective learning. OL as a knowledge creating activity suggests that the illusive aspect of "awareness" was new information linked in networks and cycles of negotiation. The awareness was a cognitive process heedful of practices that were interconnected.

Recognizing interconnected practices. Organizational learning not only was evident in planning new workshops, but also seemed to impact familiar routines and practices. An example of knowledge creating activity that involved new learning in existing routines was publishing the course calendar. In past years publishing the calendar was the sole responsibility of the Registrar and CEO. However, the emphasis on the coordinated team structure and the involvement of multiple educational partners distributed responsibility for building the course calendar.

The difficulties in building the course calendar represented a crisis that caused numerous problems for CFET. Commenting on what happened this year the following comments noted that all the deadlines were missed.

> I What happened this year?
>
> S Um, well, we missed all our deadlines. So, that wasn't good -- we had some unhappy clients, we had a lot of unhappy staff because, um, we weren't able to provide to them the information they needed to provide to the client so we had a lot of unhappiness there.
> *(Barbara, TL/Management, over ten years with centre)*

One unhappy client was an academic partner. The confusion about program start dates caused one academic partner to request that the centre postpone a program for one year rather than simply extend the deadline for applications. Postponement would have reduced CFET's anticipated income by almost a half million dollars and seriously threatened the program's long-term viability.

Within CFET the calendar required cooperation between the different networks that provided course information, course schedules, tuition fees, and other information such as a letter from the CEO. Because of the recent changes to coordinated teams and modular course schedules, new information such as calculating tuition fees was needed. Obtaining this new information required more than sharing information because persons needed to have an awareness of the interconnected practices between departments. A representative from Marketing explained,

> S Well, what I've been doing -- one project, or one task that happens annually that has sort of surfaced a lot of this year, is the calendar and you would think that publishing a training calendar would be pretty easy -- you have a schedule and you have the course descriptions and you have fees and you have the processes, but (what) we're finding in going through this is each department's going 'that's not my decision, is it?' -- yes, it is. So you have the onus now of, you know, for an example, course development is responsible for what -- course descriptions, duration, mapping out where this fits into a career, the evaluation process, Registrar's Office would be responsible for the scheduling. Operations would be responsible for indicating the manpower, the equipment and understanding that…in order to do fees, for instance, restructure the fees, that information has to be now communicated to the rest of the department. For instance, business development needs that information from operations on the costs of operating so that they can take it and work their magic with the figures to come up with the fee. So it's understanding that these decisions have to be made at a certain time and at a certain responsibility but it has to be shared with the other departments because they take that information and then do with whatever they need to do with it to meet their requirements or tasks. *(Jill, TL/Management, over ten years with centre)*

In this example, the Marketing department pointed to knowledge creating activity that circulated through the organization. From her point of view setting a course fee, a necessary step in marketing, required coordinating information with the finance department. The information was not pushed or enforced by a hierarchical authority, but actually acquired energy as information moved through networks. The acquired energy was evident as course dates were set, as materials were designed, and as costs were calculated.

From the point of view of the Office of the Registrar, solving the problem of missed deadlines involved understanding how the organization was interacting with clients and between departments.

> I Okay, how'd they deal with all this (missing deadlines)?
>
> S We've actually had meetings since then saying okay, if a client calls in wanting information on these courses, how does that client contact the firefighting centre. Well, it's through e-mail, through mail, through telephone, drop in person, um, and maybe just have contacted somebody they know in the community and that person calls the firefighting centre or whatever -- we've realized that it's very widespread -- you can go through the web to get the information, you call for it, you can go through the community college or other partners to try and get links into our website. Um, so then we realized that and then we'd talk about, you know, what kind of questions or concerns do these people ask, who can ask them and so we've come up with well, if we can provide a very basic, very generic status quo sort of cheat sheet or fact sheet that anybody can download off their computer and provide to that client, we've served the client but we also need cooperation from the operations people to provide us that information on the course descriptions and that so that we can do that, and then we started to see how the puzzle was starting to fit together.
> *(Barbara, TL/ Management, over years with centre)*

"Seeing how the puzzle fit together," seemed to support the perception of movement in the knowledge creating activity. Certainly it seemed reasonable to assume that fitting pieces together included interactions that required acceptance, support, and understanding that were not previously present in the familiar routines of building a course calendar. The new process involved interactions between multiple partners and programs. For example, managers from the network bridging team negotiated dates and continuity of programs with academic partners. The finance department calculated variables in course cost differences such as instructor travel time to off campus locations. The Team leader from Marketing explained that adjusting such cost differences and knowing how much to charge for new courses was an ongoing difficulty because clients did not like to be billed for an instructor's travel time. To fit these pieces together seemed to require collective awareness of interrelated practices. For CFET, coordinating the activity required people becoming mobilized to think and act in a different way.

One way to unite people was to reframe the calendar building process so that people could understand the different deadlines and points of view that were represented in the calendar production. Reframing seemed to be an organizational learning process. Again Marketing was a starting point of the new learning when they referred to the calendar as a business cycle stressing awareness of the different relationships involved in the process. Reframing represented an example of OL that spiralled through the organization. During my final meeting with the management team this issue of building the course calendar was on the agenda and the new term describing the business cycle and relationship process was presented. This agenda item seemed to be an attempt to build a network by attracting management support. The new concept introduced language describing the formation of the calendar in terms of a business cycle depicting the internal workings of the CFET as well as the contractual relationships with other stakeholders. The timeline represented an attempt to reshape the existing calendar development schedule into a series of relationships between the organization and its stakeholders. The point of the business cycle was to show the connections between target dates and the relationships between departments and stakeholders. Starting with the mail out date, the presentation built a timeline identifying target dates, relationships, and commitments from other parties in a new business cycle format. Although such a timeline was by no means unique, it represented network formation and movement of learning.

The movement of learning seemed to take the shape of a spiral that was moving through networks in the organization. Recall that two of the organizational leaders thought that there was a need for increased awareness about how an individual's decision impacted others in the organization. This desire for awareness, particularly related to the difficulties in preparing the course calendar, was moving through the organization. One aspect of movement was that it seemed to occur in a sequence of time. During my interview with the Marketing team leader in October she mentioned that she was considering a new way of thinking about the calendar. By the December meeting of the network bridging team the movement of the course calendar she was ready to introduce the new concept of the business cycle. Another aspect of movement was that it seemed to occur in different groups. For example in my interviews with the team leaders there seemed to be agreement that greater awareness was needed. These leaders also reported that the need for greater awareness of an individual's impact on the organization was the conclusion at a cross departmental meeting held in November. Finally, a representation of the new way of thinking incorporating awareness into a business cycle was presented to a team of managers. The discussion of this issue in these different groupings suggests that OL spiralled from the general idea of awareness about schedules to a reframed language expressing awareness as a business cycle of relationships that were linked through the building the calendar.

Reshaping existing practices regarding how the calendar was published did not occur easily. In the flattened non-hierarchal organization the reshaping process appeared to require continuous negotiation among actors in the networks mobilized for each project. Differences of opinion that in a previous central command structure might have been resolved by a direct order now depended on persuasion. Persuasion required negotiation, cooperation, and communication. One person manager described his experience with persuasion.

> S Now with that in mind, it's very difficult to get a team atmosphere going. If you do get consensus in something and maintain it, you're very, very fortunate. But you'll get consensus today -- they walk out the door -- consensus is gone. There's no binding agreement yet that will hold people to okay, you agreed to this.
>
> I How do you achieve and sustain a consensus? At this point in the organization's history it is through individual persuasion.
>
> S That's right. So, in my opinion, and I'm not anywhere -- I haven't got the tremendous amount of skills but I -- my idea is that we have to show them why we're doing it, why this is acceptable -- not why it's the right thing, why it's the acceptable thing. *(Tim, TL/Management, less than five years with centre)*

In this example the person was referring to discussions with instructors about how much course content to include in the revised modular courses. Some of the instructors did not believe that enough material and instruction time was included in the new modules. The speaker explained and emphasized why the new modular information was acceptable in terms of the big picture concept of reducing course content to manageable pieces. In terms of OL, the person attempted to reach agreement by explaining the big picture of what was acceptable, but also realized that such agreement required continuous negotiation.

Developing improved practices of communication. Another example of OL that involved learning to function as coordinated teams was a program designed to improve communication skills in the organization. Appendix D shows that twenty-four of the forty-six comments about a critical learning event related to coordinated teams involved communication practices. The professional development training included communication and team building workshops provided by an organizational consultant.

The initiative to provide a professional development program came from senior management who believed that training in communication was needed. During the Christmas meetings of 2002 the professional development program was introduced. It seemed that the staff were generally open to the idea, but negotiation about what to include in the program did occur. After hearing the proposed professional development outline some staff members inquired about including a three-year business certificate program available at the community college. As a result of this inquiry the initial plan was modified and the business certificate course was added for those who wanted to take the course. The communication workshops were scheduled during work hours. The certificate course was taught at the centre two nights a week, and the tuition for each person attending was paid by the organization. For staff an advantage was the ability to obtain college credit and over half of the staff enrolled in the certificate program.

It was not clearly evident that the professional development courses represented an innovation in organizational learning but instead built on the culture at CFET, which already seemed able to communicate well as individuals and as a group. However, the general impression that I observed seemed to indicate that staff valued and benefited from the communication workshops and the certification course. From the organizational learning lens it was unclear how the professional development courses contributed to specific examples of movement of organizational learning. Two aspects of the professional development opportunities did seem to indicate a degree of OL movement and are worth noting. One was the perception that communication practices were improved and as a result the organization was different. A second was how the community learned to reach consensus.

Two managers indicated that they thought that the goal of the communication workshops was to achieve a professional manner of communication. A professional style of communication was never fully defined but seemed to mean less gossip, fewer outbursts of anger, less blaming and personal criticism, and more open discussion of community problems. Overall, the individuals interviewed seemed to agree that by improving individual communication skills and increasing the understanding of managing a business the collective organization could be changed. For example, an instructor commented about the change he experienced.

> S Well, it (our culture) supports free-thinking and it supports – Ian is fully supportive of being able to -- I'm trying to think of the word from OB, is I should feel safe to question on anything and you shouldn't be threatened by me questioning and the other way around. That's not a problem; it's how you do it. There's a right way and a wrong way to do everything, right? Sometimes it's to come -- it just comes down to tone or even the words you use sometimes so...
>
> I So if I'm -- if I'm descriptive or sort of say it in the right way, I can question you but if I accuse you or I go into some kind of -- something that labels you as -- misrepresents you, then I'm out of line.
>
> S Yeah. Yeah and then another -- I guess another problem that could happen is how do I react to that. If I react by blasting you back, well then I'm out of line too...
>
> I Yeah because you escalate it.

S That's right, so the -- things escalate from there.

I So does the culture help itself not to escalate? Is it doing a good job of that?

S It's getting there.

I It is? Okay.

S I'm seeing a big switch in how people handle problems here. Number one, they're starting to get used to being pushed all the time -- not that I don't necessarily think that's a good thing -- you have to have some down time eventually but people are starting to learn it and I think these new business courses that we're taking -- you notice how some of the people, especially that took the organizational behavior course, start to handle themselves out there now, myself included -- it's a big difference and I've heard comments to that in that I'm 'a lot different than when I first got here'. *(Gord, Staff/Instructor, less than five years with centre)*

It is worth considering further what Gord meant when he said that there was "a big switch in how people handle problems". The reference is plural, how people solve problems. Although we have only this person's comments to believe, he indicates that he has seen changes in others, and reveals that at least one other person has seen a change in him since he "first got here". Although these are general comments by one person the change described did not seem to be an exception. Also I did not observe gossip sessions or angry outbursts, although I heard descriptions of an extended three-hour meeting between management and instructors in which persons were irate. Furthermore, the criticisms that I observed were specific to actions and practices and did not make demeaning comments about a person's intelligence or self-esteem. As a result I believed that the professional development programs was organizational learning activity that contributed to developing coordinated teams at CFET.

Consensus building was another example of organizational learning at CFET. Consensus building practices were used by CFET throughout 2001-02 as the organization participated in a democratic process to make changes in the corporate statements about its mission, vision, and values. Throughout 2001 staff at CFET worked to develop the new statements of the vision, mission, and values using group processes such as bi-monthly community meetings and sub-group assignments as well as artifacts such as a large wall chart outlining steps to be taken. Guidelines for Team Meeting rules were thumb-tacked to a staff bulletin board and underscored the importance of the individual and group processes such as honest input, specific issue perspective, vision mission oriented, customer driven, open communication, empathy, respect, sense of humor, patience, and a win/win perspective[3].

The community was actively finalizing the vision, mission, and values of the organization during the Christmas meetings in 2002. One person, who bridged both staff and management, noted that the cultural statements were completed during the Christmas meetings.

> I think that it was -- when we did the cultural statements and we outlined those cultural statements...last year is when the Christmas Meeting is when we finalized those cultural statements and said 'here they are'. *(Jesse, Staff/Instructor, more than five years with centre)*

In this instance, it seemed important to the speaker that the community as a whole adopted the new statements. Although it was not clear how a formal adoption occurred it was reasonable to conclude that agreement had taken place in a manner consistent with the shared decision-making process used by the coordinated teams, and that the organization was improving how it communicated together.

One of the instructors discussed the consensus building processes noting that in the end the process involved everyone.

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[3] CFET Team Meeting Rules December 1997

S Um, I was involved in the initial cultural discussion and we had defined our -- what our culture would be -- basically our vision, mission and values was identified then, at that point and, up until last year, we sat down again and redefined that.

I When you say 'we', can you talk about the we?

S We -- first off, when 'we' did it, it was all of the employees that were involved in that process -- sat down and we ground it out. *(Stephen, Staff/ Instructor, more than five years with centre)*

I was interested in his phrase "ground it out". He seemed to believe that it was a process in which the community regularly discussed issues and reached consensus. He continued to describe his experience of the team meetings. Before the recent growth in the number of staff these meetings were characterized as rounds in which each person had an opportunity to speak before decisions were made.

S Um, team meetings is one -- or is another which takes place every third Tuesday… I guess one thing I noticed is there is -- one person was saying there has been a change 'cause they used to be smaller and people could talk more freely in some ways they were literally rounds, and now the rounds are done by team leaders. It makes it more of an information sharing time.

I Did that cause change in those meetings, do you think?

S I would think so -- the team meetings used to be a decision-making forum and that's no longer the case. It's strictly information. One of the first team meetings I went to is -- they spent $80,000 on a radio system, -- $30,000 on radio system other stuff -- probably some truck repairs in there so, in the space of five minutes, they spent $120,000 and then the meeting broke down when they were arguing about $7.50 ball caps as to what colour they should be and shape and so on.

I How did it break down?

S It -- well, I mean, there's the colour issue alone -- there's so many -- so one guy we -- no, it's got to be black and then it was the style -- no, it's got to be engineer cap style or no, no it's got to be a ball cap. Then, what are you going to put on it -- the logo, so just too many variables that everybody had to -- had a buy-in or felt they had a...

I So, they couldn't make a decision at that point?

S Could not make a decision.

I They had to go to somewhere else or...

S Well, it took a while and finally they got it figured out, which style and let's deal with what gets put on it.

I Mm hm. And those were basically decisions -- majority vote or...

S More of a consensus thing, yeah, exactly.
(Stephen, Staff/Instructor, more than five years with centre)

Interestingly, the smaller and more personal decisions regarding the style of hat to purchase created so much discussion that the decision-making was temporarily derailed. This color and style of hat deliberation is worth commenting on because there is evidence that a back and forth discussion occurred about color and style. The evidence for this conclusion is that the discussion ended without resolution. However, these negotiations seemed to continue and consensus was eventually reached. I inquired about how the organization continued the conversations. The instructor responded that resolution was reached, "Well, I think basically around the coffee table" *(Stephen, Staff/Instructor, more than five years with centre)*. The continued discussion was not only a reflection on how the group functioned, it also suggested that there was a continuous cycle of negotiation used by the organizational to reach consensus. Such a process suggests that a continuous cycle of negotiation is another aspect of organizational learning.

Summary. At CFET, learning to function as coordinated teams was an innovation that included changed assumptions about decision-making, increased awareness of interconnected activities, and improved professional skills in communication at CFET. Organizational learning in these three areas was accomplished as networks formed as members enrolled and mobilized to develop workshops, calendars, and improve communication. Information was not simply transmitted from person to person, but circulated and re-circulated, with negotiations of its meanings occurring at various nodes of the networks through everyday interactions, team discussions, and plenary meetings. Through these negotiations, the networks themselves were engaged and reshaped. The reshaping occurred as a change in language, such as a calendar schedule being described as a cycle of business relationships, or as the community engaged in decisions that were achieved through consensus. In learning to function as coordinated teams the important role of the cultural context should not be overlooked and will be discussed more fully in the final chapter. However, the work related differences between groups presented an OL challenge CFET was resolving through coordinated teams.

Developing the Capacity to Organize Services

A second innovation at CFET that required OL was developing the capacity to organize services and anticipate clients' needs. Eleven persons made twenty-eight references to this as a critical learning event. This section discusses the innovation of a system accountability manager (SAM).

A new organizing system: An innovation requiring organizational learning that was both generative in Senge's (1990b) terms and a critical learning event in Roth's (1996) terms was the introduction of SAM. SAM was an example of OL that spiralled through the organization and was able to resolve problems by helping the organization work collectively across the work-based differences. Some of the learning results of SAM were broader awareness of project requirements as well as improved efficiencies.

The immediate problem involved scheduling fire trucks and other equipment for field training. Attempts to resolve the scheduling problem enrolled different persons and mobilized networks that eventually impacted diverse practices throughout the organization. An instructor described the initial problem, noting an increased need due to the different program modules,

> Now, all of a sudden we've got a different set or programming (modules) and things are condensed and, you know, there's a lot of things that need to be jammed into those three months. And then when they realized we could make some money at it, now we add more courses. So there was five a year, then there was seven a year, then there was eight a year, then there was eight a year, then there was nine -- ten next year. So, having to learn how to be more efficient with our equipment -- we've got 'x' number of trucks out there -- we have to take, up until this year, we had to take the same number of trucks they had six years ago and use them for five times the students -- I mean, in the year 2000, we put 8800 students through -- sorry, last year, we put 8800 students through. *(Gord, Staff/ Instructor, less than five years with centre)*

Conflict and confusion often occurred around scheduling trucks as well as other equipment required for training. Under the semester system the previous practice assigned trucks to an instructor for a five-day week regardless of the needs of a particular day. Each Friday during an instructors' meeting, assignments were made for the upcoming week. Agreement often was achieved by aggressively arguing for a particular piece of equipment. The head of operations said that he had adopted a policy: "If you don't attend, don't complain." However, as courses increased and locations varied instructors often were off site on Fridays providing instruction in an industry or municipal facility. An adaptation designed to accommodate instructors who traveled was the use of sticky notes. Instructors wrote their name and the equipment that was needed on the sticky notes and attached these notes to a white board. Each Friday the sticky notes were compiled in a schedule of equipment for the following week. The practice of using sticky notes failed to resolve the scheduling problems. The sticky notes often would fall off or be misplaced, which only increased confusion and frustration. In addition the sticky note system did not address the problem of faculty who might be on vacation or teaching at off campus sites.

These initial problems suggested that the organization was not learning how to resolve the core problem. Energy was expended in frustration and conflict about scheduling. For example, one manager seemed to express his frustration with complaints in his suggestion that persons should either attend the scheduling meetings or "not complain". It also seemed that the faculty workload was increasing as more students and modules were added. The cycle of frustration was not alleviated by the change to sticky notes. Indeed it seemed that the sticky notes increased frustration because the notes could so easily be lost or misplaced. The organizational learning challenges did not spiral to creative resolution, but to frustration and conflict as courses and modular options grew. A critical learning event that contributed to helping the organization reduce the cycle of frustration and meet the new demands in the work setting was SAM because the innovation enabled information to flow between all of the different departments at CFET.

"Just a bit of a brainchild." The leading point of the spiral of the innovation stemmed from a technician who thought that equipment, like people, could be scheduled on the calendar function of Microsoft Outlook. Such a scheduling process, he thought, would help resolve persistent scheduling problems evident in ongoing staff conflict and the organization's inability to provide consistent and reliable monitoring of field operations. The initial step taken by the sustainability coordinator was to develop a

proposal that was later presented as a request for development funding from the Network Bridging Team.

The innovation SAM developed software that built on the calendar function of Microsoft Outlook. The following quote describes the initial creation of SAM.

> S Oh yeah. Yeah, it's pretty steady but the -- I kind of created a system on the computer that tracks, um, instructor assignments and tracks resources and it's called 'SAM' -- Systems Accountability Manager -- way out in left field from working in tech services as a mechanics role, but...
>
> I How'd you come across this? Is this one you experimented with?
>
> S Just a bit of a brain child and I -- I like computers, I like computer software and I can see the technology is there -- it's a -- the best part of that is everybody has access to it because one of the first things I noticed when I came to work here was, even in the role I was doing, I was given a computer right away because Ian was big on having the communication out there -- he said 'you need it -- you need to e-mail, if nothing else, so you know what's happening in the institution' so that probably always stuck with me 'cause I -- you're in contact with e-mail then -- we started to use Outlook more for booking things and I could see how that was working -- actually the -- probably the first thing I started out with on there was we used to book our vehicles on the board and I thought well, if we can book time slots for people on Outlook, why can't we book vehicles so I started to develop that and it actually worked and it's still in place today -- it's been in there for probably -- oh, I would guess, two and a half or three years and it works really well. *(Ken, Staff/Instructor, more than five years with centre)*

SAM was an innovation that provided a means to organize and link different departments, resources, and individuals so that the organization was able to anticipate and provide reliable services to a client. Although the technician described the idea as "a bit of a brainchild" much more than improvisation was involved in the innovation. Improvisation according to Weick and Westley (1996) often occurs when an individual consciously acts to adapt a specific situation to a general plan such as front line changes on the field during a battle. SAM represented a complex network of human and non-human intermediaries.

Intermediaries. One intermediary was the existing computer system. Without such connectivity available it is doubtful that SAM would have even been envisioned. A second crucial intermediary was the funding made available by the NBT. Although the specific minutes of the decision by the NBT were not available on several occasions I observed the CEO to describe two principles used to decide whether or not to support proposals. One criterion was whether or not the proposal would save CFET money and the second was whether or not a proposal would make CFET money. Since SAM was a cost saving efficiency it was supported, but without the initial resources for the development the idea likely would have not been implemented. The agreement to fund the initial proposal provided energy, in this case the money to hire a software consultant to help develop the new system accountability manager.

Financial resources continued to be an important non-human intermediary in developing the SAM innovation. The initial proposal was made to the NBT for a four thousand dollar investment to develop the software, but as SAM evolved additional funds were secured. SAM grew from the initial investment of $4000 to a total of $15,000. Ken believed that the benefit to the organization was well above the investment, perhaps five times the investment.

SAM was intentionally brought into the organization in small ways that represented ongoing negotiation. The staff member described the process.

> So we've just kind of slowly developed as we go -- there have been lots of little bumps and grinds because we had a basic idea when we started and it grew and grew and grew and grew and grew. Now the whole inventory's on there. It looks after our inventory; it looks after our costing for the

inventory. We can go on there and we can pull up all our consumables and it tells us what's on hand and it tells us the cost, what our cost is -- so, for the accounting people, they can just make one entry and they know within about three seconds the total on-hand inventory and what the cost is.

I This is a major -- major learning event for the whole organization.

S Yeah. Yeah. Yeah, it sure is. *(Ken, Staff, more than five years with centre)*

From the small-scale beginnings it seemed that the accountability program helped the organization to better schedule equipment and assured that instructors had the required resources.

Through intermediaries SAM formed a network that translated equipment schedules. Following the four moments of translation described previously, the initial point of problematization was when SAM defined the problem—equipment scheduling and began to enrol support for the new software program. Interest was supported by the financial contribution to hire the software personnel necessary to create SAM. From these two moments OL moved as instructors were enrolled, often in one-one coaching instruction. Mobilization ensured the stability of SAM as an alliance was established through Internet connections and the IT department at CFET. Success of the network replaced the linkages between equipment and instructors with a new alignment through the sustainability coordinator. This translation process represented an aspect of OL movement in which the initial idea gained momentum and led to further discussions about the role of the sustainability coordinator. Later OL spiralled from a more efficient means of scheduling to conversations about fuel consumption practices in field fire simulations.

OL across work related differences. An indication of continuous cycle of negotiation was evident also because SAM was modified to become not only a means to service contracts, but also a means of organizational learning across work related differences. In this case not only was SAM used to schedule fire trucks, but SAM was adapted so that all equipment required for courses was scheduled through SAM. The movement of OL spiralled beyond the instructors to link with the Business Development Department who used SAM as a means to communicate what equipment and services were needed in courses contracted with clients.

The movement of the knowledge creating activity represented a spiral of learning in the organization that began as an idea that took shape as a proposal funded by the NBT. The funding added energy to the idea and further development was accomplished through hiring a software consultant to design SAM. Movement was further accomplished as a network of instructors were interested, enrolled, and mobilized in the system accountability manager. The network become more complex as other networks such as business development became interested. Stabilization occurred as the innovation SAM received additional resources and expanded to other departments.

The innovation SAM improved the capacity of the organization because it has created increased utilization of the equipment.

> I And what's the organization learning here -- is how to use more capacity
>
> S I guess how to be more efficient with (how) it used to be, you got a truck, you had it for a week, even if it sat for a couple -- for a certain period of time, it was your truck.
>
> I So as an instructor, you had a truck.

S I had a truck assigned to me for a week -- even if I would only use it for two days, that was my class's truck for the week. Now that's my class's truck for the hours that I need it. *(Gord, Staff/Instructor, less than five years with centre)*

Rather than scheduling trucks by the week, trucks were scheduled by the hour and according to the need of the instructor.

The introduction of SAM also created a potential difference of interpretation about equipment and need, and changed the role of instructors. One staff member commented.

S So he brought that program in here and he had it done for us and then eventually he took it over, so how he's booking it all. And then you run into the problems of Ken's not an instructor so he doesn't necessarily know what equipment is needed when -- certain trucks work better on certain courses, it's not just necessarily a truck -- I might need a certain truck because it's got a particular piece of equipment on it that I need for that program, so then there's all those headaches and it's still evolving. We are still trying to fine-tune that system. For a while, we were actually three weeks in advance on our bookings and then we dropped back to the Friday meetings again, making sure everybody's good for the week, and the next week and the week after and then the...

I Mm hm. Sounds like it's a little better now though.

S It's getting there. It's getting there. *(Gord, Staff/ Instructor, less than five years with centre)*

In this case the instructor saw improvement even though the system was being fine-tuned. Fine-tuning referred to ongoing attempts to utilize SAM throughout the organization. For example, SAM was being modified to record vacation days and overtime days.

As a result of the introduction of SAM the traditional role in which instructors were responsible for classroom instruction and field equipment changed. Ken became a kind of arbitrator who assigned what was needed according to an awareness of the global picture of the organization.

S Yeah. Yeah. So what happens is it works really well up until the case where there's a greater need sometimes -- let's say an instructor needs to pull a trailer to Brooks and another instructor has a big pulling vehicle and he's just going to the airport. So, I'll come in there and I'll make the switch and I'll make that happen /cause you kind of need somebody to look from the global sense and get the greater need for all those involved.

I Right.

S And with that concept, then that became a good idea for operations. So what happened with operations was the instructors used to book all their resources and they were booked to classrooms and all those types of things -- they were all doing that themselves. And it worked but it was always a bit of a battle because, with personalities, you couldn't really see the global need -- like, you booked this fire truck because you wanted it but another guy might have needed it worse than you and you couldn't really realize that 'cause you're not looking at it from a global sense, you're looking at it from your point of view only. So that was another thing that kind of I think developed at Outlook was well, if I'm the Administrator of that, I can be the Administrator of this and I can oversee the whole thing and I can make changes where -- and be the Arbitrator where they need to be. So that was -- I guess Outlook, when you think of it, was where SAM started from. *(Ken, Staff/Instructor, more than five years with centre)*

In other organizations Ken might be called an efficiency or quality control manager. At CFET his role was related to sustainability. Not only was this a reference to the aspect of his work which was to reduce the environmental impact of the operation, it was also a subtle reminder that the organization was becoming oriented to being a self-sustaining organization.

The circulation of SAM as an idea and technology was accomplished on an incremental basis. As previously stated the initial training for faculty was offered in face-to-face sessions between Ken and instructors. These one to one meetings were important in helping faculty to understand the software program and to develop the necessary skills. The end result seemed to have increased the use of the innovation by faculty.

S Well, it took time certainly -- I'll bet it took at least a year to a year and a half to be able to have it -- have it accepted and have it work. But I worked really closely with each individual -- if they had problems, I made it known that absolutely anything, call me any time and I will sit down with you at your own computer and we'll work through it.

I Okay. And that was your troubleshooting role.

S Yeah. Yeah. That was pretty essential because them flailing away on their own, they would have got really frustrated and I was able to capture that early and get the problem out of the way and move on. *(Ken, Staff/Instructor, more than five years with centre)*

In this case the innovation of the new accountability system was facilitated because of the one-to-one support provided. In this way the new learning occurred as the result of the relationships developed by the sustainability coordinator.

There was also evidence that the SAM was translated from an equipment-scheduling network to a service-capacity network. For example, although SAM was initially software meant to schedule trucks usage expanded as new capacities were added or discovered. One of these discoveries led to a new awareness of fuel consumption by the organization. Fuel consumption previously was calculated as a sum total consumed over the season. One consequence of the sum total calculation was that the amount of fuel that a particular course or instructor used was not known. While CFET was under government the measure of this amount was whether or not it was over or under an annual budget. In the entrepreneurial culture costs related to fuel consumption were calculated and a user fee charge was assessed. An adaptation to SAM used the software program to calculate the amount of fuel each course consumed.

Knowing the amount of fuel consumed by each course made it possible to compare different fuel consumption levels between instructors. Such information opened the possibility of organizational learning that reflected double loop learning (Argyris,

1991) because it enabled the sustainability coordinator to enter into a dialogue with faculty and ask, "What is the optimum fuel consumption for field training?"

> I asked some girls to do some research for me and they found all our fuel records and all our student numbers for the past four years and through a lot of our work we have been able to drop our fuel consumption, per student, 46% over four years.
>
> I Major -- major achievement.
>
> S Just incredible. Nobody knows it. It happened so subtly. It's become a mindset of the instructors 'cause they have their handle -- their arm on the tap -- they're the guys that can either say 'turn it off' or 'turn it on' and it's fostered through us, through them, they're bringing back ideas on how to make a better prop, how to use the fuel better, how to do a more controlled burn and it's gently made it's way through the institution and when you start looking at the records, there it is -- 46% drop in fuel consumption. Just absolutely amazing. *(Ken, Staff/Instructor, more than five years with centre)*

Ken described the organizational learning processes noting that the new information about per class fuel consumption made it possible to have conversations with instructors about the optimum size of fire that was best for teaching in the field simulation exercises. These conversations often compared different usages of instructors and help to create a new awareness about the size of a burn simulation that was best suited to the instruction. Since the instructors were the ones who literally had their hands on the levers controlling the amount of fuel to be used, they began to consider what size burn was best for instructing in field simulations. This OL activity occurred over time and involved dynamic interrelationships of persons thinking and interacting, the simple technology of a fuel control levers, and knowledge that was available as the result of new software packages. Perhaps one could imagine that a top down management model could achieve a 46% drop in fuel consumption, but it is doubtful that such a top down model would be as successful. However, the success of this innovation at CFET suggests that organizational learning created its own dynamic energy. In the OL process energy was initially created by interactions and enrolment in networks. The energy for organizational learning increased through dialogue and negotiation, and as agreement was achieved and shared the willingness to think differently about fuel consumption propelled the innovation through the organization.

The shift of SAM to a capacity network also was evident in the alliances that formed around SAM. The Marketing department for example was able to link SAM to the contractual agreements. This information provided dates, locations, and other pertinent details of a program offering that was available to each person in the organization through an Internet connection.

SAM improved the capacity to organize client services, but some problems continued. An ongoing issue for the organization was the ability to adapt to the need or service at a particular site. For example, on one occasion information about the contract for a search and rescue course was entered and all arrangements were recorded in SAM. The instructor was assigned and knew to provide the necessary rope for the instruction. The client knew that they were responsible to ensure that an elevated platform, such as the roof of a building, was available as a training setting for the rescue operation. Unfortunately the instructor arrived with a rope sufficient for the two-story building used at the CFET campus. The client had provided a roof platform, but it was on a three-story building. As a result the instructor had to adapt to a three-story building rescue using a two-story rope. The short rope story is illustrative of an ongoing tension in the organization. An instructor put it simply, "The instructors are at odds with the Marketing department constantly because of scheduling." *(Gord, Staff/Instructor, less than five years with centre)*

Summary. Developing the capacity to organize services involved coordinating the different viewpoints of client need and developing a system to manage the diverse equipment schedules. SAM represented a new practice of organizing that increased the capacity of the CFET to provide timely and efficient materials for courses. Developing capacity generally occurred as networks were mobilized to meet specific needs. Movement of information circulated as persons interacted in the informal discussions. SAM, a network was achieved as intermediaries, such as the equipment and financial resources enrolled and mobilized other networks. SAM also changed as it spiralled through the organization. Knowledge of the specific course fuel consumption led to further conversations and reflections about the optimum fuel consumption for a specific class. As a result not only was an innovation in equipment scheduling initiated, but organizational capacity to service the needs of clients was improved.

Developing a Modular Curriculum

A third innovation requiring OL was developing a modular curriculum format that changed semester courses to flexible modular courses. In this case nine persons made fifty-one references about learning to develop the modular curriculum. Developing the modules was a critical learning event crossing work related differences between departments. As a result of OL policy changes were implemented policy, productivity increased, and behavior patterns in all CFET departments were altered. This section discusses an innovation that included building networks across numerous boundary challenges, and a continuous cycle of negotiation represented by an on-going process of re-jigging course materials.

Building networks across numerous boundary challenges. CFET decided to change its course offerings from a semester format to a more flexible modular curriculum. The decision was made partly as a response to client feedback that preferred shorter courses, but the decision also responded to changes in firefighting certification guidelines and a strategic goal to reach new markets. As in the previous innovations discussed the curriculum development involved new knowledge creation, intermediaries, and the formation of a network.

Developing a modular curriculum involved networks that were mobilized by conversations with CFET stakeholders regarding new job-performance-requirements and the suggestions of how to increase capacity. These conversations involved such intermediaries as the external advisory board, the published standards and job-performance-requirements in the industry, as well as ongoing discussions within CFET. An initial point in the cycle of negotiation began with the Director of Curriculum Development. He described his impression of why a change in curriculum was warranted.

> In '98, when we moved out (of government), we started looking to do things because the people -- there are lots of people wanting to take (course in the) trade. We have to do more because we know there's a demand -- people want [the training]. So then we knew [that] our facilities were not enough to meet the demand of the people. We must expand. That's how the expansion plan began. Okay, some of the things we have to do now. Okay, how do we do this? Do we still go with one week, big block? We felt no. If we go with smaller chunk we could even put it on a c.d. -- that's how the modules came and the standards are also written to small units and then, again, we included development staff.
>
> I And who is that?

> S That's Christiana, myself, and Katy we come up with ideas and then we take it to the advisory and say this is what we are thinking of doing.
> *(Frank, TL/Management, more than ten years with centre)*

Frank reasoned that the limitations of the campus facilities could not meet student demand unless the facilities were expanded or the curriculum design was changed. Since the capital costs for expansion were not available and there seemed to be client preference for shorter courses the decision was made to redesign the curriculum. Implementing this change required organizational learning to build networks of political and educational alliances with a number of different external partners and internal staff. Conversations that took place represented cycles of negotiation as the innovation moved through the network. For example, developing a modular curriculum involved a cycle of negotiation as the innovation was shared with the different groups who reviewed the new curriculum modules. CFET mobilized an alliance to support the new curriculum by vetting the new curriculum through the CFET Provincial Advisory Board and the national certification body. Conducting such a review was important because approval legitimated the development process of the new curriculum and enabled CFET to ensure that the new curriculum met the needs of industry.

Gaining acceptance for the new curriculum changes involved negotiation between CFET, particularly the head of operations and the director of curriculum, and external stakeholders such as the CFET Advisory Board, the Fire Commissioner's Offices, and municipal fire chiefs. This negotiation with municipal fire chiefs crossed geographical and political boundaries traditionally thought of as rural and urban. In addition a temporal boundary, the beginning of the fall curriculum, made meeting in each municipality impractical because of the time individual meetings would take. Frank and Tim traveled around the province to regional clusters of fire chiefs to explain the reasons for the curriculum changes to fire chiefs and mobilize support for the new courses. These meetings were occasions of organizational learning that involved face-to-face negotiation and often struggled over the interpretation of the new terms.

> S Because generally the instructors hear what the standards say and what we say, they follow. There's a reluctance in the method of delivery changes and this big module with the standards change was a big change for us, (for) our instructors and (for) the local people because fire service is not --they don't want to change. They just want to do what they have been doing. So we see that and that's the biggest hurdle we have and the challenges -- that's why Tim and I are doing these fire hall meetings for the region -- even the change of name is a big thing for them. It shouldn't really be. If the quality is the same and it was called 'part 1'. Now it has five more modules and it'll be called a series. So, (the fire chiefs) why can't we have (the former course titles) because they are so used to that, they just don't want to change. Even to say series 100 is a big thing for them. No, it should be Part 1 firefighter -- that's what we are used to from 70's. *(Frank, TL/ Management, more than ten years with centre)*

In this conversation the CFET manager described several aspects of a knowledge creating activity that involved forming networks. First the organization had to learn to overcome the resistance to change. Although Frank described this as resistance to name changes and course title changes, the changes seemed to raise additional questions for the municipal fire chiefs. One of the significant sources of resistance was that individual firefighters wondered how the new courses would impact the certification levels. Based on these conversations CFET added into the new course calendar detailed explanations of how previous certification levels and courses matched with the new course modules. In the current calendar such an explanation was included. Adding the explanation was important in forming networks because such a description showed that CFET had listened and understood feedback from the regional face-to-face meetings. The written explanation in the course calendar also equipped the CFET internal network of administrative staff to answer inquiries from a diverse number of individual firefighters and potential students.

Building network support for the new curriculum also involved internal relationships with CFET instructors. In this case external feedback regarding the curriculum change was presented for review to the faculty.

> Now that's kind of, in some ways, it's kind of a -- I don't want to say it's a notion of learning that -- okay, here's some scanning that we're doing with the environment, you know, and these ideas are happening out there, we're in touch with them, and they come in to us. Now, is there a place in the organization where you're saying 'hey, we're not doing this quite right -- we need to improve it or, you know, we're getting this kind of feedback from instructors and students and we need to change this... *(Frank, TL/Management, more than ten years with centre)*

Frank represented one point of view about the internal review process that seemed to suggest that there was faculty involvement and acceptance of the new curriculum. Only hinted at in this comment was the faculty response that continues to be an ongoing cycle of continuous negotiation because differences continue to be negotiated.

Faculty differed in their sense of satisfaction with the modular format, but a concern for one instructor was the amount of time available to review the modular format and the lack of sufficient resources to conduct the review procedure.

> S Yeah, there's been a lot of bumps in the road with the material and certification. Some of it willingly corrected, some of it not but I don't think it's reluctance on those individuals not to correct it, it's because those individuals have a bigger picture than we do as instructors. They know what is needed at the end of the road. We're just taking the material and delivering it and we're saying 'okay, we need more material'. There's two things prior to getting here though that we need to really deal with, Mark, for you to understand is that there was an opportunity for instructors to have input into these module development and, in fact, the modules were being passed around but because of our work schedule, we didn't have the time to make the commitment to that and, finally, somebody had to make a decision and said 'look, we've set a deadline for these things -- they need to be developed' and so they assigned one individual to review

> these things and, of course, you have that individual's slant on it, okay, and they may have included stuff that we wouldn't have included and, at the same time, they may have missed stuff that we felt was necessary. So we're really -- the organization has itself to blame for that. There should have been two or three instructors, you know, at very -- at the three different levels -- new, medium and old, assigned to that task and that's all they do for that year -- they work with the course developers. Like, the organization was not big enough to be able to take -- have that luxury to do it, and so the thing is well, when do you want us to do this. We're not going to do it at night and on weekends for free. We should be compensated somewhere. Well, of course, now you're talking contract issues and stuff like that and the organization is not in a position to be able just to pay a lot of that overtime out. So, it's not that they didn't want to; it's their ability to do it. *(Dave,TL/Management, more than ten years with centre)*

In this case the faculty member was concerned not only with the quality and accuracy of the modular information, but with the resources allocated to the review process. From his point of view the resources required to enrol and mobilize a review network were inadequate. He seemed to think that the inadequacy had not been communicated, or was not included in the cycle of negotiation that shaped the curriculum. Differences can be a source of enrichment in understanding (Gherardi & Nicolini, 2002). In this case the modular format brought about greater efficiencies, but may have not fully represented the different interpretations of education quality between curriculum managers and instructors.

The two different viewpoints resulted in different understandings of quality that are represented in the following two selections. In the first the Director of Curriculum Development commented.

> S We feel that -- we were finding that to give a big block of material was not meeting the needs -- that if we could have it in smaller chunks, that they could take a smaller unit, time-wise also, spend a shorter time, and do a smaller unit and get credit for that. *(Frank,TL/Management, more than ten years with centre)*

The manager's view seemed to focus on the overall relationships and advantages for volunteer fire fighters to be able to register in smaller time periods. Also because the change in course modules was a strategic decision made by CFET management he was also interested in the growth in enrolment that this change would bring.

From an instructor's viewpoint the notion of quality instruction and the impact of increased registration on education was different than that held by the Director of Curriculum Development. The instructor was concerned that the instruction time was reduced in the smaller modules, and he believed that the faculty saw their role not only as providing course input but also helping students remember basic safety techniques. Time for refresher sessions about training in the breathing apparatus was not considered in the modular format and presented a problem for the instructor.

> S To give you an example of a lecture that we know used to take four hours for -- to talk about breathing apparatus, for instance, and it didn't matter whether it was an industrial-based course or the firefighter-based course -- that has been cut down to an hour.
>
> I Oh, wow.
>
> S Okay. And we've gone from probably 50 pages of information to three. *(Dave, TL/Management, more than 10 years with centre)*

The manager's viewpoint represented the feedback received from stakeholders that the course length had been a problem and his awareness that courses needed to be redesigned for persons to take courses in smaller units. From one of the faculty viewpoints, the learning content was reduced too much and did not allow for the realities that occurred when persons take modules. The faculty concern was for student safety as well how to manage the time available for instruction with the time required to help students recall basic instruction.

Central to the discussion of the change to course modules was that the organizational learning at CFET was dependent on interactions with the different viewpoints. Since acceptance of the curriculum change ultimately depended on the acceptance of clients, CFET was not in a position to force acceptance and instead became engaged in a continuous cycle of negotiation. CFET mobilized networks of external and internal stakeholders. These networks engaged in further discussion and negotiation about the course design. It was apparent that negotiation occurred because CFET responded to feedback from external stakeholders, modifying the initial course design and clarifying the relationship between the former curriculum and certification requirements in the new modules.

CFET also discovered networks that represented a non-human intermediary nested in interrelated practices of the previous CFET curriculum. The development of the modular curriculum required updating, uncovering, and documenting decades of intertwined resource material to meet the new job-performance requirements. A person responsible for curriculum development thought of herself as a "detective" because she was trying to discover and resolve the difficult issues of plagiarism and copyright. While "under government" the practice of course development had involved sharing information freely, information was included in course materials often without references. However, as the organization became a business, documenting and protecting copyright became more important. Speaking frankly, a curriculum design staff member commented:

> S When we were under the government, because we weren't making money and because you want to share information freely, a lot of the stuff that was in the courses was just plagiarized from other places and put in there, but now we put our copyright on it and say that (it's ours)-- and

> we're going to sell it...*(Christina, Staff/Instructor, over ten years with centre)*

In the past, course information was nested in practices that freely shared information. Now the staff member was engaged in knowledge production and modification, in this case identifying and documenting information that was nested in previous practices.

The nested nature of the practices, however, was sometimes so intertwined that the original source itself was not accurate. The curriculum designed explained how her work was that of a detective.

> S Well, some of it is because you recognize it -- because you recognize it from where it was before; however, then you talk with one of the guys who was an instructor here when I first came and I brought this up with him and I said 'well, where does this come from -- this isn't your -- you know, this is from somewhere else' and he said 'well, this is from -- this particular Manual' and he said 'and I gave them all the information to put in there' because you see then -- because you're a government institution and you shared things, he shared it with them, they put their copyright on it and sold the book and so then if we want to use that information, which came from this institution in this first place, we have to (speaker digresses explaining how to reference the source). *(Christina, Staff/Instructor, more than ten years with centre)*

In this case the constellation of past practices regarding sharing materials needed to be reviewed and referenced. The development of course modules raised legal issues regarding the integrity of the organization and copyright infringement. Untying these historical connections was not accomplished by a single activity, but achieved in small steps. Resolving the copyright issue, however, was important if the organization was to develop and protect its course material. Such protection was required to prevent the knowledge from being adopted by CFET competitors as the organization expanded its programs across different provinces.

Of interest to this study was the realization that the innovation of developing a course module represented more than a one-time change of curriculum. Instead it involved a continuous cycle of negotiation engaging interrelated practices and networks. The decision to provide modular courses indicated movement of organizational learning similar to the process of "progressive engagement" (Gherardi & Nicolini, 2002) because the innovation cycled between CFET stakeholders, the business development department, instructors, course developers, and administrative support persons who prepared and scored tests, provided certificates, and collected fees.

Human intermediaries were important in building the different networks and the innovation literally traveled as the two CFET managers met in regions across the province. But OL also traveled as instructors met with one another, reviewed course materials, and made changes. The concept of a continuous cycle of negotiation suggests that, even though the modules had been implemented and were a key factor in expanding student enrollments, organization learning continued to travel. This continuous cycle of negotiation was evident in the curriculum revisions that occurred in the ongoing re-jigging of the new modules.

Re-jigging the modules. Negotiation was ongoing within networks because the modular course design was continually being revised, updated, or recombined. Another aspect of the ongoing negotiation was the increased cooperation between staff.

Intermediaries that were central to creating the modules were persons working in the curriculum development who wrote, reviewed, and created modular templates, and faculty who worked closely with these persons. The work involved negotiation through social relationships.

S Oh, I think there's a -- people are lot more willing to share everything -- well, before, people seemed to have their little private turfs that they were trying to protect; whereas, the way that it is now, everybody sort of has to be involved with everything.

I So an example of private turf would be what?

S Well, I mean, even just the -- with the instructors and their teaching loads, it seemed that some people were the Code Specialists and some people were the, um, Officers Specialists and some people were the Props Specialists, or whatever, just like it used to be on the fire truck -- they used to tell them that being able to control the pump was a -- like witchcraft -- you had to be initiated. But now, it seems as if everybody's willing to, um, try and learn different -- to expand their skills as instructors to -- to learn how to market, to be more involved for the institution as a whole rather than just for themselves. *(Christina, Staff/Instructor, more than ten years with centre)*

In this example CFET personnel were learning to interact by sharing skills and building teamwork rather than by seeking individual turf protection. This learning was situated and ongoing, but seemed to reduce previous turf battles. The perception that there were fewer turf battles mentioned by this person was also evident in several other references such as how job evaluations were conducted and the development of the new mission statements. However, one of the senior faculty members discussed the turf issues differently. In his assessment, only two instructors, the two senior instructors, were capable of teaching all of the course options at CFET. He believed that newer faculty could not teach, for example, fire officer training courses.

Fewer arguments over turf protection could be an indication of organizational learning as new information was created through networks and cycles of negotiation. If so there would be examples in new interactions or practices. One example involved faculty learning how to teach differently.

S Yeah. Um, yeah, the modules brought in a big change and took a lot of learning -- not just from those making them and so on, but instructors -- reorganizing, having to (teach in a new way) and so on and...

I What's going on with that? That would be a kind of a little different twist than what you do but you're involved with that.

S Yeah. It was hard for them at first because they kind of felt that the modules didn't have enough material in them, which is fair -- we've added a lot of material since the beginning. The problem there, I guess is the modules were written to meet the JPR's and we teach about the JPR's so that extra was not there which used to be there, I guess, but now is back. That took a lot of work... *(Katy, Staff/Instructor, more than five years with centre)*

The new knowledge created in this case involved ongoing negotiation as to what information should be included. This person seems to indicate that there was a back and forth movement in the understanding and interpretation of the course material. She seems to support the earlier point made by the faculty team leader that the new course materials were not sufficient and required additional course materials.

The modular format also introduced the possibility of creating new relationships that enabled the organization to continue to learn in incremental ways.

S That's right, yeah. And, um, sometimes there are, you know, courses that marketing says they're going to have, (but) then there's no materials or no course -- the material's there, but it's here, there and everywhere and so an instructor and course development will work together and there's the course. *(Christina, Staff/Instructor, more than ten years with centre)*

In this case several relationships were mentioned. One relationship was between the instructor and course developer. A second relationship involved the two instructors who worked together to develop the course. Such relationships involved the course material as one intermediary, the text, but other intermediaries may also have been involved such as course props to be used in the field simulation. Although it was not clearly evident it seemed that a new routine was developed that could spread through the organization.

Another example of movement of the continuous cycle of negotiation seemed to be evident in different perceptions of the modular courses between new and old employees.

> S Yes. Yeah. So that's -- and that change is difficult for some -- well, it's difficult for the new people 'cause they don't have the old stuff. It's difficult for the old people because there are some things that have changed and so you can't be teaching exactly the same stuff as what you did before.
>
> I Right. Mm hm.
>
> S And it's difficult for the people in the fire service to make that change too because a lot of their promotions was based on them having our old officer courses and now we have to look at the way the new modules are set up and say, well, what was equivalent to this old course -- which of the new modules are equivalent. *(Christina, Staff/Instructor, more than ten years with centre)*

This example illustrated some of the aspects of the continuous cycle of negotiation. In the example the speaker first described the different negotiations that occurred for new and old instructors. The focus then shifted and was concerned the difficulty students might experience. Finally the cycle reflected different perspectives in between instructors and managers in the understanding of the needs of students and quality of education.

The evidence from this study supports the argument that organizational learning is a knowledge creating activity. The following comments described an example of how negotiation about the modular courses fostered a knowledge creating activity.

> S Yeah. Other changes, like just as for things that I haven't really been connected to. I've just kind of heard talk about or whatever that there's a lot of changes that have happened in how they do things in the field -- is how I kind of understand it, just from, you know, conversations here and there.

I Mm hm.

S And ...

I First of all, what do you hear about that? You'd be in a position where you might hear two different sides so what do you hear?

S Um, just, um, putting different practical courses together and making one big scenario. Like, one thing that happened -- maybe it was this year, maybe it was last year, we combined the practical for Part 4 and C-6 which is the practical course for (commanders) Tactics and so their -- the C-6 students, which is usually a small class, about six or ten students at the most, would be the commanders of the scenario and the Part 4's are the firefighters. *(Katy, Staff/Instructor, more than five years with centre)*

The learning event that occurred provided a successful learning combination that enabled instructors to not only work together, but also provided instructors with the opportunity to view how commanders actually functioned in practice. As a result there seemed to be at least the potential if not actual possibility of reflection about teaching and the role of an instructor.

Summary. The development of the modular course format was a "work in progress" at CFET, and as such is an illustration of real time knowledge creating activity mobilizing networks and circulating information. Building networks across the numerous boundary challenges often involved direct interaction with clients in regional meetings as well as direct phone calls. Central to the network was establishing allegiances with persons who could support and interpret the new curriculum changes. Within CFET these networks were organized in the actual practices of writing and improving the course modules. The continuous cycle of negotiation occurred as courses were developed and continually revised in the on-going work. As a result of these negotiations curriculum writers ensured that the course materials matched the previous curriculum content, the industry job-performance-requirements, and followed the modular format. Instructors were included in the cycle of negotiation through their feedback about the course content and their recommendations to improve the quality of the course content. The movement of knowledge through CFET seemed to be manifest in an ongoing re-jigging of materials to match the new flexible format.

Comparisons of the Innovations

This study offers evidence of three innovations that involved organizational learning. First, each innovation was the result of new information identified and recognized by the organization. The new information included increasing collective awareness between the different teams, creating a system accountability manager software program to increase organizational capacity, and implementing a new modular curriculum that required coordination in the design and development of the new curriculum.

Second, each innovation required the mobilization of networks involving humans and non-humans. Learning to function as coordinated teams mobilized cross department teams that responded to learning challenges such as developing fire and emergency planning for health care facilities or implementing a new course calendar. Most prominent in the mobilization of networks was the development of a software program to increase capacity in organizing services. This system accountability manager literally linked human and non-human resources in scheduling trucks, reducing fuel consumption, and impacted assumptions about the size of fire needed during training sessions. Networks were formed across geographic, political, department, and other boundaries to build support for the innovation of flexible course modules. These networks not only helped to provide legitimacy for the new curriculum, but also to determine what had been plagiarized from elsewhere long ago.

Finally, each innovation indicated that organizational learning continuously moved between networks as a continuous cycle of negotiation. Coordinated teams, for example, required ongoing attention and coordinated actions between individuals and groups. If an individual or team was not aware, consequences ranged from a crisis that threatened ongoing partnerships to inconveniences, awkward adaptations, or inability to provide certain programs. The network that formed around the system accountability manager was initially planned to provide a means to schedule trucks, but became a means to record fuel consumption per class. Such knowledge led to ongoing discussions and later practices about the type of fire that was best for fire simulation practices. As more staff accepted SAM as a means of scheduling equipment, the system was improved and became a convenient means for staff to schedule vacation days and record and store overtime. Developing modular curriculum was an example of continuous cycles of negotiation in which the curriculum was continually being developed, as the organization learned how to manage ongoing certification processes and develop flexible educational materials.

However, there were differences in these innovations. For example, each innovation had a different focal point for learning. Learning to function as coordinated teams was a two-fold focus that changed assumptions about how decisions were made and targeted ways to improve professional communication skills. Developing the capacity to serve clients focused on coordinating different interpretations of the client need and the new software program to improve the equipment scheduling process.

Developing modular courses focused on how to integrate changing industrial standards, revise existing curriculum, and provide quality instruction.

I concluded there were common processes and distinct features of the organizational learning evident in these innovations. Common processes seemed to include an emphasis on awareness of the interrelatedness of individual actions and the relationship between humans and non-humans in forming networks. Distinctive features seemed to involve movement or circulation of information and were distinguished as conditions that fostered creativity and increased allegiance. How these aspects of knowledge creating activity related to the broader issues of organizational learning is discussed in the next chapter.

CHAPTER SIX

CONTRIBUTION TO CONVERSATIONS IN ORGANIZATIONAL LEARNING

In this chapter I discuss the contributions and implications of this thesis to ongoing conversations in organizational learning. Grounded in an empirical study using data driven analysis these contributions shed light on the conditions that foster organizational learning.

The first contribution draws from two different literature streams to develop a synthesized perspective of organizational learning. A second contribution broadens empirical work focused primarily on occupational groups to describe OL that pays attention to cross-department and cross-work differences. Central to this contribution is the understanding of OL as a negotiated phenomenon that acquires energy as OL cycles through the organization. A third contribution adds to conversations regarding the definition of OL by highlighting OL as a process comprised of three elements: new information, networks, and cycles of negotiation. A fourth contribution this study makes is its exploration of how organizational culture shapes organizational learning. I add to the limited number of empirical studies in the field by illustrating how organizational culture was flexible enough to support the three innovations examined in this thesis.

Following the discussion of these four contributions the chapter examines implications that this cross-functional, process-oriented view of organizational learning has for existing OL concepts, power relations in organizational learning theory, and for decision makers. I conclude the study by exploring further areas for research about organizational learning as knowledge creating activity.

Developing a Synthesized Perspective of Organizational Learning

This study brings together two particular streams of literature, organizational theory and educational theory, to underscore the interactive and participatory aspects of OL. One aspect of this synthesis expands the focus of OT literature that views OL as a product, but neglects the processes of OL. As a result the OT viewpoint tends to have a managerial perspective that frames the value of learning in terms of management goals or values. Because I bring educational theorists into the conversation this study broadens the conversation to reveal details of the situated learning experiences not previously explained in organizational theory. These details help to identify the non-imitable value of organizational learning.

Another aspect of this synthesis expands the understanding of OL beyond that of a summation of individuals. Because summative learning does not explain collective learning that is embedded in activities and non-human entities, I have used the concept of networks (Gherardi and Nicolini, 2000, 2002) to explain how learning becomes embedded in an organization. However, Gherardi and Nicolini (2000, 2002) focused on a translation process in which learning was centered upon an object. I extend their work by showing that the movement in OL across the organization is a negotiated phenomenon in which new knowledge is created and acquires energy as OL cycles through the organization. This circulation of OL across the organization is taken up in the next section.

OL that is Cross-Department and Cross-Work Differences

This study contributes to the literature of learning in situated practices by providing an empirical study of organizational learning across the entire organization.

Early research by educational theorists, particularly those interested in situated learning, developed the understanding that learning occurred in relationships and engagement in work practices. These works in situated learning are important for their insights into how newcomers join a profession (Lave and Wenger 1991) or how members of an occupation successfully achieve their roles/identities (Brown and Duguid, 1991). However a limitation of these studies was their focus on occupational groups. My interest was grounded in the contextual understanding of organizational learning as engaged across all departments and workers of the organization. A feature of this view is how organizational learning occurred through ongoing cycles of negotiation across work groups.

Organizational learning required on going negotiation across work related differences in the organization. OL seemed to move back and forth between individuals and groups, changing as these persons or groups made suggestions or discovered new ways to use the information. Interestingly, the development of SAM was not a linear process, but represented complexity learning as different people engaged in discussing and developing SAM, but the direction in which it expanded remained unpredictable. That is, the knowledge shifted because something new got added every time people were interacting with it. The something new that was added was indeterminate, but seemed to move beyond individual contributions and was evident in such things as the upbeat morale or the confidence that problems were solvable when the community members worked together.

The notion of intermediaries (Callon, 1991) was initially used to describe a socio-technical relationship. This study used the concept of intermediaries to describe the impact on organizational learning suggesting that OL circulated as a continuous cycle of negotiation through an organization. This view highlights several aspects of OL not seen by the concepts of stored information, improvisation, or exploration and exploitation. The importance given to intermediaries, human and non-human, is one example this study provides. For example, artifacts were intermediaries that seemed to serve a dual purpose. Artifacts such as the hats with the corporate logo were a cultural symbol retaining the continuity of the fire fighting identity even as the community became more entrepreneurial. However, the artifact/innovation such as SAM became an important network that translated the equipment scheduling process.

Another illustration of the important role of intermediaries was evident in the change from semester courses to modular courses. In this change the modules represented cross-department and cross-work negotiation with changes in firefighting certification guidelines, stakeholder feedback, and strategic decisions designed to reach new markets. The decision to change to modules also required ongoing negotiations between stakeholders, staff in business development, instructors, course developers, and administrative support persons who made and scored tests, provided certificates, and collected fees. OL involved a circulation of knowledge through intermediaries, and occurred through a continuous cycle of negotiation.

Intermediaries were dynamic and represented practices of teaching and curriculum development; practices that also represented negotiation. I have shown that negotiation occurred between the job performance review (JPR) standards, course designers, the previous course materials, instructors, a pilot group of stakeholders, and ongoing interactions between instructors and students. However, because these modules were continuously altered in light of new students, new courses, or new practices the negotiations did not end in a fixed modular course but became an ongoing dynamic at CFET.

Organizational Learning as a Process Comprised of Three Elements

A third contribution of my study is to the ongoing conversation regarding the definition of OL. Whereas many have defined OL as a process that may involve accessing stored information (Huber, 1991), improvisation (Weick & Westley, 1996), or forgetting (Hedberg, 1981), the perspective of process seems to be linear and utilitarian. Drawing instead on understandings of process as becoming (Whitehead, 1967) this study argues for understanding the organizational learning process as a discovery activity. My work proposes that OL is knowledge creating activity comprised of three elements: new information, networks of intermediaries, and cycles of negotiation.

Huber (1991) claimed that organizational learning was stored and existed as potential information for the entire organization, but seemed to assume that knowledge was a tangible product like a report. The findings from this study suggest that organizational learning was not stored information. Instead, the formation of the SAM network and the subsequent interactions created knowledge that became a resource to the organization not as a static concept, but embedded in the dynamic joint activity of everyday practices and relationships. In fact, it seemed evident that fuel consumption information was not stored but invisible and was knowledge not accessible to the organization until SAM introduced different relationships.

SAM illustrated an example of the dynamic aspects of knowledge creating activity. Initially SAM provided learning focused on solving a scheduling problem, but later SAM helped to create new knowledge about fuel consumption. This new knowledge was used to reflect on the best means for instruction. The resulting fuel efficiencies certainly were an important result, but the organizational learning occurred in the interactions and new relationships mobilized in the network of SAM, the system coordinator and faculty. Without the dynamic capacity to add new knowledge to the networks organizational learning would likely not have been successfully implemented.

Although SAM in some ways could be viewed as an improvisation, because it was achieved by one person's creativity, SAM also shows the impact of different intermediaries in forming networks. The different intermediaries were numerous, but several can be noted. Humans included a software programmer, the instructors, and the sustainability coordinator. Financial resources were evident in the money allocated by the network bridging team as well as the investment of time. Technological artifacts included the software program, personal computers, and the virtual Internet network designed for CFET. Finally, textual intermediaries such as the sticky notes or the particular terms to describe specific trucks contributed to the new innovation.

Although there are similarities with improvisation, SAM seemed to represent a process that was different in several ways. The way in which SAM developed from one person's idea to use the Microsoft Outlook program to schedule equipment was different than improvisation. Improvisation presents a view that centers on experience but lacks the accompanying perspective of organizational interactions and supportive activities to implement learning. At CFET the OL possibilities emerged as SAM was implemented. Not only was feedback invited, but also suggestions were regularly adapted into SAM over eighteen months. Because of this new information, changes were made to the software program to make SAM more robust and convenient. For example, not only was

SAM used to schedule equipment but it also became an important source of information about the client contract, a means to schedule services, and later it was adapted to enable staff to verify and record personal information such as vacation and overtime.

From this example much is revealed about organizational learning as a knowledge creating activity. It was evident that SAM became an organizing tool for CFET, one that improved and increased CFET capacity to meet the increased demands. Also, SAM evidenced multiple learning activities and created new conversations, new roles, new relations, new practices, and new information for the organization. Improvisation may describe how an innovation begins, but does not describe the knowledge creating activity that encompassed the changing of roles or the patterns of conversation that occurred in the development and organizational integration of an innovation such as SAM.

Organizational Culture and Organizational Learning

A fourth contribution this empirical study makes is to the growing literature focused on understanding how organizational culture contributes to organizational learning. My work used data driven analysis to examine cultural contributions to organizational learning such as Cook and Yanow (1993) and Yanow (2000). The study illustrated how the organizational culture was flexible enough to support development of the three innovations examined in this thesis.

Earlier I noted that organizational learning combined dynamic and structural influences on learning. The dynamic influences were evident at CFET in the cultural support for individual creativity that led to the initiation of SAM by the Sustainability Coordinator. The structural innovations increased the capacity of the organization to deliver services to clients.

At CFET the cultural influences on SAM provided an important background that both explains how novelty entered the organization and how the cultural capacity was enhanced. Two particular cultural themes were influential. First, the move away from government was an important cultural context and was motivation to improve services to "show them what we can do". The motivation to improve services focused attention to the new idea about SAM. Second, changing to an entrepreneurial culture engaged persons in new and different relationships and practices that resulted in three innovations. These two cultural influences were malleable and helped CFET in developing new structural innovations.

Other ways that culture impacted organizational learning at CFET were also evident. The broad sociological influences such as fire fighting culture and the structural decisions that required the firefighting centre to become self-sustaining are an important context for SAM because they help to explain structural influences. However, the cultural aspects at CFET such as the daily interactions, the listing of infractions, and the care and concern for individuals also influenced the creation of SAM. Clearly the new idea to use the Microsoft Calendar function to schedule equipment as well as people was an creativeness generated in a specific context. Culture was the context out of which the idea grew because culture provided the means for sharing ideas in relationships and interconnected practices.

In a recent interview, Argyris distinguished between processes that enable organizational learning and the individual actions of organizational learning (Crossan, 2003). This distinction was consistent with previous OL concepts put forward by Argyris, concepts that draw from the individual and psychological disciplines. Another view, favored in this thesis, is that individual actions cannot be separated from the culture of the organization and the different interpretations, language, activities, artifacts that make up the organization.

Implications for Organizational Learning Theory

This study discussed illustrations of organizational learning as a knowledge creating activity at CFET. Organizational learning occurred as the organization shifted to coordinated teams, used intermediaries to learn how to organize services, and rotated through the organization in a continuous cycle of negotiation. Following is a discussion depicting how the view of organizational learning as a knowledge creating activity adds new insight not found in other OL concepts. I discuss two aspects of organizational learning theory: deutero-learning and overcoming OL barriers.

Deutero-learning and collective awareness. Knowledge creating activity that increased collective awareness was a key aspect of CFET's organizational learning in the shift to coordinated teams. This emphasis on awareness was evident particularly as the course calendar was organized through negotiations about classes, times, application dates, and specific costs. During the past year, mistakes appeared in the calendar that could be retraced to the newly emerging flattened communication network and management structure. The consequences of these mistakes created confusion for CFET staff in the responses it received from student applicants. The mistakes required CFET staff and management to explain and negotiate the CFET emergency services program with its educational partners, and the emotional toil of such explanations led to the first cross departmental meeting in this flattened management structure.

The knowledge creating activity involved learning how to coordinate information between internal actors, across different departments, as well as coordinating consistent information with external partners. Internal knowledge creating activity occurred during a cross team meeting of the departments of curriculum, business development, emergency services, and the director of operations. This meeting, the first of its kind since the reorganization, resolved that individual awareness and an increased amount of interaction between the departments were needed. The solution was anything but simple because it involved multiple levels of organizational learning.

The solution to increase individual awareness seems consistent with previous arguments about levels of OL (Argyris & Schön, 1978). Argyris and Schön (1978) would note that the group was engaged in deutero-learning because the learning concerned new assumptions about coordinated teams in the calendar building process as well as in the cross-department decisions made about the calendar. At CFET the resolution to the calendar dilemma was greater awareness and seemed to be an abstract thought about learning. However, in addition to altering the thoughts of persons, this activity required a change not only in assumptions but also in the practices. Furthermore, awareness also linked networks in the organization. As such this example differs from deutero-learning, which relies on individual cognition and does not explain the relationships of networks or movement of organizational learning through networks.

Deutero-learning is an abstraction that suggests a level of learning, but it does not describe the processes in which individual awareness links to collective awareness in the organization. Findings suggest that the knowledge creating activity occurred as networks identified new information and linked together to create heightened awareness in the collective of the impact of individual interactions on the system.

Overcoming OL barriers. Conceiving OL as knowledge creating activity that includes new information, networks, and a continuous cycle of negotiation also alters the understanding of OL barriers that exist in organizational learning. Argyris (1986) suggested that defensive practices were a significant barrier to OL. However, defensive practices focus attention, if not blame, on the individual for blocking OL. A different focus, seeing OL as the knowledge creating activity, uses the understanding of intermediaries such as people, resources, language, and artifacts to recognize how learning, awareness in this case, was linked with different networks involved in the calendar formation. Focusing on the networks shifts the attention given to specific defensive practices to ask, for example, what additional intermediaries are necessary to foster learning across the organization.

OL as a knowledge creating activity could be considered a launching point because such activity was a means to recognize new information in the system. The notion of launching point is also suggestive of the activity involved as new information crosses boundary challenges. CFET was learning to cross boundaries that were temporal, geographical, sociological, technological, and political. For example, the revised flexible curriculum moved across such boundaries. Multiple boundary challenges also are faced in the challenge of successfully combining with the community college. Not only will CFET have to build bridges between its fire fighting culture and the academic environment, but will also face the challenge of learning how to function in the political environment of a new provincial department

Understanding organizational learning as knowledge creating activity may also improve efforts to facilitate organizational learning by focusing on the different networks and relationships comprising an organization, as well as specific practices. The interactions in the CFET networks provided energy for the dynamic circulation of organizational learning. These networks of relationships required negotiation between members and departments of CFET of application dates, course descriptions, as well as internal deadlines required to publish a course calendar. To resolve the difficulties that occurred due to the lack of coordination of information, CFET tightened its network structure by organizing a meeting of all of the key persons. The department manager chaired the meeting. As a result of the meeting new practices were established coordinating information between the Office of the Registrar and the EST program as well as between CFET and its academic partners.

Another dimension brought to light by intermediaries was the relationship of this project to the community. At CFET the arrival of the published calendars mobilized individuals to mail out the calendars. One could call this simply a distribution practice, but the fact that the activity involved both staff and management suggested that it was an example of organizational learning. I was invited to help pack the calendars into envelopes. Although I was scheduled to return to campus to attend a class, I was able to observe the process for about thirty minutes. Intermediaries included available staff and management as well as the conference room that was a gathering point for the community. Persons not only sorted materials and filled the envelopes, but also read the particular sections related to their areas and often discussed differences in the course descriptions. For example, differences in fees between courses were discussed and questions about why some courses were more expensive than others were asked. During this discussion I learned that different tuition was charged for fire fighter courses and for emergency service technician courses.

Although it seems possible that the printing firm could have provided the sorting and mailing service, the activity and the conversations that occurred while sorting the mailing seemed to be knowledge creating activity that involved community. This activity was important to CFET because it increased collective awareness and seemed to prepare staff, for example, to answer the various curriculum questions that potential students might ask during a telephone inquiry.

Implications for Power Relations and Organizational Learning

Power differences between management and staff seemed to balance the different interests existing in the organization so that each benefited from the knowledge creating activity. The increased capacity achieved through the innovations supported management interests because these innovations increased income and reduced costs thus improving the profits of the organization. But this success also benefited staff as the organization grew. Staff also benefited as job evaluations recognized not only personal knowledge but also intangible contributions to teamwork and their individual efforts to attain organizational goals. Another benefit for the staff that chose to participate was the opportunity to earn college credits for their professional development. The balance of power relationships seemed to enhance network links in decision-making and increased cooperation between networks. One way that the network was enhanced was evident in the negotiation that added the opportunity to receive college credit. This negotiation increased the willingness of staff to participate in the new network of coordinated teams.

Since previous attempts to form coordinated teams had not been successful, it was significant that staff recognized and chose to participate in the new learning that promoted the change to an entrepreneurial culture.

As previously described much of the literature on power and the impact of power relations on organizational learning has focused on different interests between managers and workers. These interests seem to place much of the burden of organizational learning on the individual. However, understanding organizational learning as knowledge creating activity could be a more effective way of achieving organizational learning goals because it acknowledges the role of networks among different organizational groups and levels in creating organizational learning.

The emphasis on individual contributions to organizational learning, while important, may actually occur through networks. Networks link humans and non-humans and cross boundary challenges in ways that the emphasis on individual responsibility does not. A case in point is the different emphasis between the networks that foster support for organizational safety and those that support organizational learning. CFET like many organizations tended to give the individual primary responsibility for organizational learning. Individuals were responsible to read their email and to be aware of policies. Although the organization provided workplace learning for professional development, the learning seemed to focus on improving individual skills. Apart from the annual Christmas meetings, which were a considerable expenditure of organizational resources, the opportunities for the organization to reflect on its processes seemed to stress individual responsibility. For example, in Chapter 4 I described how new persons challenged CFET communication practices during the Christmas meetings, and noted that the plenary group did not stop to explore the reasons or learning opportunities that might exist because of these new voices.

By contrast a similar organizational issue that involves individual awareness is organizational safety. Organizational safety like organizational learning requires knowledge and attention by the individual, but also focuses on the actions that an organization takes to provide safe work environments. Unlike organizational learning safety often has a standard established in provincial regulations, case law, or labor relations. Meeting organizational safety regulations may also require safety audits that target specific acts and knowledge important to ongoing safety issues in an organization. These audits ask members specific questions about how the organization supports individual knowledge and participation in safety practices or awareness. Incentives are provided for the organization to foster safety awareness, such as reduction in insurance premiums if staff in the organization score at a high level of awareness on a safety audit. These incentives are also evident in workshop safety courses or artifacts such as hard hats, safety goggles, and warning vests. Finally, safety requires awareness of all persons on a site. Each of these different aspects of safety suggests that safety is achieved not because of individual awareness, but as a result of effective use of power that supports the activities, which build networks that support individual and collective awareness.

Additional Implications for Decision Makers

Understanding OL as knowledge creating activity focuses attention on actions taken by the collective organization that foster organizational learning. Given the contrast between the power relations that shape organizational safety and those that shape organizational learning, it is reasonable that decision-makers might wonder what structures could be initiated to enhance organizational learning. In this section I discuss two implications for decision makers: fostering collective reflection and implications for managing change.

Fostering collective reflection. Promoting reflection (Argyris, 1991; Weick & Westley, 1996) has been identified as one way to increase organization learning. Reflection often is linked with individual thought processes such as cognition, rumination, contemplation, or deliberation. At CFET reflection occurred when CFET asked customers what they wanted or for feedback about the new curriculum. Clients in turn responded that they wanted shorter courses combined with distance learning opportunities. Most importantly CFET achieved this information by mobilizing networks that included the new industrial JPR guidelines, feedback from clients, and ongoing changes in the course modules. These were activities in which reflection was not only individual thought, but also interactions between networks that involved reflection. However, the reflection process was not simply the thought of an individual, but was structured in ongoing interactions between people and texts. An administrative staff person who typed templates for course modules described the learning as a *work in progress* because she was continually involved in interactions and negotiations of what needed to be added, changed, or removed from the curriculum. As a result, reflection was not isolated but intricately involved relationships between individuals, groups, JPR guidelines, and language. Decision-makers could emphasize collective reflection practices and include group reflective activities involving staff as well as management in reflection processes as part of ongoing routines such as an end of the day work review period. Another possible means to support OL activity could be through meaningful audits of organizational learning issues. Audits are an important organization tool used to evaluate safety in an organization. The goal of collective reflection practices would be to link learning in daily front line activity with all levels of the organization. The strategic organizational learning example of an active action review (Thomas et al., 2001) that was noted earlier is illustrative of the kind of structural support that might be required. Interestingly, after action reviews do not require new skills, but could be a routine easily implemented if the appropriate power such as legislation or financial incentives was provided.

Implications for managing change. While experiencing rapid changes in the organization CFET seemed to have no resistance to change. Given that it is reasonable to expect at least minimal resistance to change, other decision makers might be interested in how CFET achieved such wide acceptance, sustained the upbeat moral, and overcame territorial disputes. CFET culture seemed to foster the belief "we're in this together" as well as confidence that the organization would "survive". In addition to the cultural themes of trust and ability to pull together there were other practices that contributed to the successful management of change. A key person was clearly the CEO who shared in the daily interactions, humor and playfulness evident at CFET, but also provided transparent reports to the bi-weekly community meetings. As a result, staff believed that management was working for the survival of the organization. Also, by sharing information in the ongoing community meetings staff and management were engaged in discussion and trust building. In this case, the willingness of the CEO to engage in an open dialogue with staff seemed to stimulate impromptu discussions with community members during the informal coffee times , which helped to build support and willingness to implement change. Likely another important aspect of the trust and confidence engendered was the promise made to retain staff that differed with the proposed changes until they were able to obtain employment in another organization. Staff seemed to perceive this promise as a source of support and may have felt that they did have choices in whether or not to accept the proposed change.

Future Research Topics

There are several research areas that could be explored in relation to understanding organizational learning as knowledge creating activity. Studies have been conducted of how managers make decisions, but few studies describe the impact of networks on learning. It seems that further exploration of the ways in which management is linked in new knowledge, networks, and the cycles of negotiation that enable organizational learning would benefit OL theory. Also, further studies could identify the different conditions necessary to link staff and management networks, and the ways that power functions in these networks. One area would be to explore further the understanding that managers have about organizational learning. This study did observe managers in the Network Bridging Team, but focused more on the impact of knowledge creating activity on the organization as a whole rather than on management.

A second area that could be further explored is how movement is understood in organizational learning. I have used the metaphor of a spiral to describe the movement of organizational learning. However, there are indications that the spiral image could be misleading because it tends to assume inclusiveness and indicates harmony. Actual interactions that involve networks and learning may not always be harmonious. Rather than a spiral it seems that other metaphors of movement such as turbulence or give and take matrix exchanges could be explored to better understand the movement of organizational learning. Also, single learning events such as the Tylenol scare of the 1980's moved quickly through not only an organization but also modern society. Such single learning events do not seem to spiral through an organization as much as they spring from ruin and confusion.

This study has focused on a relatively small high reliability organization, but further studies could explore larger high reliability organizations. For example, it would be helpful to understand how networks in larger, less culturally homogeneous organizations are formed, and whether or not these networks rely on informal processes or more highly structured learning processes.

Another possible organization to study would be a more bureaucratic organization. Such a study could also ask about the movement of OL, how knowledge creating activity flows in a bureaucracy, and what unique challenges it confronts.

Finally, a future study might explore particular aspects of power presented by the networks formed with technology. SAM was not only accepted by the CFET staff, but was a creation of the staff and consequently seemed to become a management instrument for managing personal vacation and overtime. It is interesting to ponder how staff might respond to a different software program instituted in a different setting, particularly if staff perceived that a different software program was less helpful and oriented to surveillance of staff activities or productivity. In such a case the response might be less likely to accept the innovation or more resistant to how the software might be used.

Closing Comments: OL as Knowledge Creating Activity

A question that has lingered through this study was the one posed during my initial visit at the fire school: "Are you going to get dirty?" Getting dirty might be the appropriate metaphor because OL seemed to occur when people were in conflict over dates, were struggling to schedule equipment, or were tediously comparing different versions of curriculum. These embodiments of learning were acts that defied distinctions and precise separations. Instead the individual acts always seemed to overlap with actions of another person or group, and in fact were messy. The messiness caused by the overlap of individual, group, and organizational interests makes organizational learning interesting. As I found myself pulled deeper into the world of firefighters and emergency training I wondered whether or not I was "getting dirty". I believe that I have gotten dirty with the data, and that the data illustrates conditions that foster organizational learning.

Readers may agree that new information, networks and intermediaries, and cycles of negotiation describe organizational learning, but still wonder what *is* organizational learning. This ontological question strikes to the central question of organizational learning. Attempts to answer this question have identified numerous descriptions of organization learning such as trial and error, strategic, generative, systemic, or multi-level. Each of these descriptions has attempted to bring light to the black box of organizational learning. Perhaps those who simply say that it is a non-imitable resource are correct, that organizational learning exists but we can't really know what it is or how to duplicate it, but I disagree. The ontological nature of organizational learning may continue to be elusive, and the conditions that foster organizational learning may be messy rather than precise. However, one consistency across all of the attempts to describe organizational learning seems to involve the three aspects of knowledge creating activity depicted in this study: new knowledge, networks, and cycles of negotiation. Organizational learning was evident because new information was found; knowledge was shared as persons and artifacts interacted and, even if in only a small way, the collective was different because the new information continued to cycle through the organization. That is a conclusion my study supports.

REFERENCES

Argyris, C. (1986). Reinforcing organizational defensive routines: An unintended human resources activity. *Human Resource Management, 25*(4), 541-555.

Argyris, C. (1991). Teaching smart people how to learn. *Harvard Business Review, May-June*, 99-109.

Argyris, C. (1993). *Knowledge for action: A guide to overcoming barriers to organizational change.* San Francisco: Jossey-Bass.

Argyris, C., & Schön, D. (1978). *Organizational learning: A theory of action perspective.* Reading, MA: Addison-Wesley Publishing Company.

Barley, S. (1990). Images of imaging: Notes on doing longitudinal field work. *Organizational Science, 1*(3), 220-246.

Barney, J. B. (1991). Firm resources and sustained competitive advantage. *Journal of Management, 17*, 99-120.

Belasco, J. (1990). *Teaching the elephant to dance: The manager's guide to empowering change.* New York, NY: Penguin Group.

Bell, S., Whitwell, G., & Lukas, B. (2002). Schools of thought in organizational learning. *Journal of the Academy of Marketing Science, 30*(1), 70-86.

Billet, S. (1999). Guided learning at work. In D. Boud & J. Garrick (Eds.), *Understanding learning at work* (pp. 151-164). London and New York: Routledge.

Billet, S. (2001). *Learning in the workplace: Strategies for effective practices.* Crows Nest NSW, Australia: Allen and Unwin.

Billet, S., & Boud, D. (2001, July 2001). *Participation in and guided engagement at work: Workplace pedagogic practices.* Paper presented at the 2nd International Conference on Researching Work and Learning, Calgary, AB.

Bogdewic, S. P. (1992). Participant observation. In B. Crabtree & W. Miller (Eds.), *Doing qualitative research* (pp. 45-69). Newbury Park, CA: Sage.

Boje, D. (1991). The storytelling organization: A study of story performance in an office-supply firm. *Administrative Science Quarterly, 36*, 106-126.

Boje, D. (1995). Stories of the storytelling organization: A post-modern analysis of Disney as "Tamara-land". *The Academy of Management Journal, 38*(4), 997-1035.

Boje, D. (2001). *Narrative methods for organizational & communication research.* London, Thousand Oaks, New Delhi: Sage Publications.

Bouchard, P. (1998). Training and work: Myths about human capital. In S. M. Scott & B. Spencer & A. M. Thomas (Eds.), *Learning for life: Canadian readings in adult education* (pp. 128-139). Toronto, ON: Thompson Educational Publishing.

Bradbury, H., & Mainemelis, C. (2001). Learning history and organizational praxis. *Journal of Management Inquiry, 10*(4), 340-357.

Brown, J. S., & Duguid, P. (1991). Organizational learning and communities-of-practice: Toward a unified view of working, learning, and innovation. *Organization and Science, 2*(1), 40-57.

Bruner, J. (1990). *Acts of meaning.* Cambridge, MA: Harvard University Press.

Burrell, G., & Morgan, G. (1979). *Sociological paradigms and organisational analysis.* London: Heineman Educational Books.

Callon, M. (1986). Some elements of a sociology of translation: Domestication of the scallops and the fishermen of Saint Brieuc Bay. In J. Law (Ed.), *Power, action and belief: A new sociology of knowledge?* (Vol. 32, pp. 196-233). London: Routledge and Kegan Paul.

Callon, M. (1991). Techno-economic networks and irreversibility. In J. Law (Ed.), *The sociology of monsters* (pp. 132-161). London: Routledge.

Callon, M., Law, J., & Rip, A. (Eds.). (1985). *Texts and their powers: Mapping the dynamics of science and technology*. London: Macmillan.

Carspecken, P. (1996). *Critical ethnography in educational research*. New York and London: Routledge.

Chaiklin, S., & Lave, J. (Eds.). (1996). *Understanding practice: Perspectives on activity and context*. Cambridge, New York, Melbourne: Cambridge University Press.

Clegg, S. (1999). Globalizing the intelligent organization. *Management Learning, 30*(3), 259-280.

Coe, N., & Bunnell, T. (2003). 'Spatializing' knowledge communities: Towards a conceptualization of transnational innovation networks. *Global Networks, 3*(4), 437-456.

Coffield, F. (2002). Breaking the consensus: Lifelong learning as social control. In R. Edwards & N. Miller & N. Small & A. Tait (Eds.), *Supporting lifelong learning*. London and New York: RoutledgeFalmer.

Cook, S., & Yanow, D. (1993). Culture and organization learning. *Journal of Management Inquiry, 2*(4), 373-390.

Coopey, J., & Burgoyne, J. (2000). Politics and organizational learning. *Journal of Management Studies, 37*(6), 869-885.

Crabtree, B., & Miller, W. (1992). A template approach to text analysis: Developing and using codebooks. In B. Crabtree & W. Miller (Eds.), *Doing qualitative research*. Newbury Park, CA: Sage.

Crossan, M. (1996). The knowledge-creating company: How Japanese companies create the dynamics of innovation. *Journal of International Business Studies, First Quarter*, 196-201.

Crossan, M. M., Lane, H., & White, R. E. (1999). An organizational learning framework: From intuition to institution. *Academy of Management Review, 24*(3), 522-537.

Czarniawska, B. (1997). *Narrating the organization: Dramas of institutional identity*. Chicago, IL: The University of Chicago Press.

Czarniawska, B. (1998). *A narrative approach to organizational studies* (Vol. 43). One Thousand Oaks, CA: Sage Publications.

Davis, B., Sumara, D., & Luce-Kapler, R. (2000). *Engaging minds: Learning and teaching in a complex world*. Mahway, New Jersey: Lawrence Erlbaum Associates.

Deetz, S. (1996). Describing differences in approaches to organization science: Rethinking Burrell and Morgan and their legacy. *Organization Science, 7*(2), 191-208.

Denzin, N., & Lincoln, Y. (2001). The discipline and practice of qualitative research. In N. Denzin & Y. Lincoln (Eds.), *Handbook of qualitative research (Second Edition)* (pp. 1-28). Thousand Oaks, London, New Delhi: Sage Publications Inc.

Diesing, P. (1971). *Patterns of discovery in the social sciences*. Hawthorne, New York: Aldine Publishing Company.

Dougherty, D. (1996). Organizing for innovation. In S. Clegg & S. Hardy & W. Nord (Eds.), *Handbook of organization studies* (pp. 424-439). London, Thousand Oaks, New Delhi: Sage.

Easterby-Smith, M. (1997). Disciplines of organizational learning: Contributions and critiques. *Human Relations, 50*(9), 1085-1113.

Easterby-Smith, M., Crossan, M. and Nicolini, D. (2000). Organizational learning: Debates past, present and future. *The Journal of Management Studies, 37*(6), 783-796.

Fenwick, T. (1998). Questioning the concept of the learning organization. In S. M. Scott, Spencer, B., & Thomas, A.M. (Ed.), *Learning for life: Canadian readings in adult education* (pp. 140-152). Toronto, ON: Thompson Educational Publishing.

Fenwick, T. (2000). Putting meaning into workplace learning. In A. Wilson, Hayes E. (Ed.), *The handbook of adult and continuing education* (pp. 294-311). San Francisco: Jossey-Bass.

Fiol, C., & Lyles, M. (1985). Organizational learning. *Academy of Management Review, 10*(4), 803-813.

Fontana, A., & Freer, J. (1994). Interviewing: The art of science. In N. K. Denzin & Y. S. Lincoln (Eds.), *Handbook of qualitative research* (pp. 361-375). Thousand Oaks, CA: Sage.

Forster, N. (1994). *The analysis of company documentation*. Thousand Oaks, CA: Sage.

Garrick, J., & Clegg, S. (2000). Knowledge work and the new demands of learning. *Journal of Knowledge Management, 4*(4), 279-286.

Gherardi, S., & Nicolini, D. (2000). To transfer is to transform: The circulation of safety knowledge. *Organization, 7*(2), 329-348.

Gherardi, S., & Nicolini, D. (2001). The sociological foundations of organizational learning. In M. Dierkes & A. B. Antal & J. Child & I. Nonaka (Eds.), *Handbook of organizational learning and knowledge* (pp. 35-59). Oxford: Oxford University Press.

Gherardi, S., & Nicolini, D. (2002). Learning in a constellation of interconnected practices: Canon or dissonance. *Journal of Management Studies, 39*(June 4), 419-436.

Goffman, E. (1967). *Interaction ritual*. Garden City, NY: Doubleday.

Hager, P. (1999). Finding a good theory of workplace learning. In D. Boud & J. Garrick (Eds.), *Understanding learning at work*. London and New York: Routledge.

Hardy, C., & Clegg, S. (1996). Some dare call it power. In S. Clegg & C. Hardy & W. Nord (Eds.), *Handbook of organization studies*. London, Thousand Oaks, New Delhi: Sage Publications.

Hedberg, B. L. T. (1981). How organizations learn and unlearn. In P. C. Nystrom & W. H. Starbuck (Eds.), *Handbook of organization design* (Vol. 1, pp. 3-27). New York: Oxford University Press.

Howell, S. L., Carter, V. K., & Schied, F. M. (2002). Gender and women's experience at work: A critical and feminist perspective on human resource development. *Adult Education Quarterly, 52*(2), p112, 116p.

Huber, G. (1991). Organizational learning: The contributing processes and the literatures. *Organization Science, 2*(1), 88-115.

Kincheloe, J. (1999). *How do we tell the workers: The socioeconomic foundations of work and vocational education*. Boulder, CO: Westview Press.

King, N. (1994). The qualitative research interview. In C. Cassell & G. Symon (Eds.), *Qualitative methods in organizational research: A practical guide* (pp. 14-36). London, Thousand Oaks, New Delhi: Sage.

Kreigel, R., & Brandt, D. (1996). *Sacred cows make the best burgers: Strategies for developing change-ready people and organizations*. New York, NY: Warner Books.

Kuwada, K. (1998). Strategic learning: The continuous side of discontinuous change. *Organization Science, 9*(6), 717-737.

Langley, A. (1999). Strategies for theorizing from process data. *The Academy of Management Review, 24*(4), 691-710.

Latour, B. (1991). Technology is society made durable. In J. Law (Ed.), *A sociology of monsters: Essays on power, technology, and domination* (pp. 103-131). London: Routledge.

Latour, B. (1992). Where are the missing masses? The sociology of a few mundane artifacts. In W. Bijker & J. Law (Eds.), *Shaping technology/Building Society* (pp. 225-258). Cambridge, MA and London, England: The MIT Press.

Lave, J., & Wenger, E. (1991). *Situated learning: Legitimate peripheral participation.* Cambridge, UK: Cambridge University Press.

Law, J., & Hetherington, K. (2001). *Global Visions and Local Materialities*. Retrieved February 7, 2004, from the World Wide Web: http://www.comp.lancs.ac.uk/sociology/soc029jl.html

Leavy, B. (1998). The concept of learning in the strategy field. *Management Learning, 29*(4), 447-466.

Lieberman, M., & Montgomery, D. (1988). First-mover advantages. *Strategic Management Journal, 9*(51-58).

Lincoln, Y. S., & Guba, E. (1985). *Naturalistic inquiry*. Beverly Hills, CA: Sage.

Livingston, D. W. (1999). *Researching expanded notions of learning and work and underemployment: Findings of the first Canadian survey of informal learning practices.* Paper presented at the Researching Work and Learning: A first international conference, University of Leeds.

Maier, G., Prange, C., & Rosenteil, L. v. (2001). Psychological perspectives in organizational learning. In M. Dierkes & A. B. Antal & J. Child & I. Nonaka (Eds.), *Handbook of organizational learning and knowledge* (pp. 14-34). Oxford: Oxford University Press.

Marsick, V., & Watkins, K. (1999). Envisioning new organisations for learning. In D. Boud & J. Garrick (Eds.), *Understanding learning at work.* Crows Nest NSW, Australia: Allen and Unwin.

Martin, J., Feldman, M., Hatch, M. J., & Sitkim, S. (1983). The uniqueness paradox in organization studies. *Administrative Science Quarterly, 28*(3), 438-453.

Matthews, J., & Candy, P. (1999). New dimensions in the dynamics of learning and knowledge. In D. Boud & J. Garrick (Eds.), *Understanding learning at work.* London and New York: Routledge.

McGrath, R. G. (2001). Exploratory learning, innovative capacity, and managerial oversight. *Journal of Management Inquiry, 44*(1), 118-131.

McMillan, M. (1996). *Fallen Friend*. Retrieved April 12, 2004, from the World Wide Web: http://www.firefighterexchange.com/Misc/TributeStory1.html

Miller, D., & Shamsie, J. (1996). The resource-based view of the firm in two environments: The Hollywood film studios from 1936 to 1965. *Academy of Management Journal, 39*(3), 519-543.

Miner, A., & Mezia, S. (1996). Ugly duckling no more: Pasts and futures of organizational learning research. *Organization Science, 7*(1), 88-99.

Moffat, S. (1997). Gender issues in teaching information technology courses by distance education. *Distance Education, 18*(2), 370-379.

Morgan, G. (1997). *Images of Organization* (Second ed.). Thousand Oaks, London, New Delhi: Sage Publications.

Nelson, D., & Quick, J. (1997). *Organizational behavior: Foundations, realities, and challenges*. Minneapolis/St. Paul, New York, Los Angeles, San Francisco: West Publishing Company.

Nonaka, I., & Takeuchi, H. (1995). *The knowledge creating company: How Japanese companies create the dynamics of innovation*. London: Oxford University Press.

Ntiri, D. (2001). Access to higher education for nontraditional students and minorities. *Urban Education, 36*(1), 129-144.

Oakley, E., & Krug, D. (1994). *Enlightened leadership: Getting to the heart of change*. New York, NY: Simon & Schuster.

Orlikowski, W. (2002). Knowing in practice: Enacting a collective capability in distributed organizing. *Organization Science, 13*(3), 249-273.

Patton, M. Q. (2002). *Qualitative research and evaluation methods*. Thousand Oaks, London, New Delhi: Sage Publications.

Porter, M. E. (1980). *Competitive strategy*. New York: Free Press.

Prahalad, C. K., & Hamel, G. (1990). The core competence of the corporation. *Harvard Business Review, 68*(3), 79-91.

Proctor&Gamble. (2004). *Proctor and Gamble History*. Proctor and Gamble Global Operations. Retrieved February 7, 2004, from the World Wide Web: http://www.pg.com/about_pg/overview_facts/history.jhtml?rc=-5

Reger, R. K., & Huff, A. S. (1993). Strategic groups: A cognitive perspective. *Strategic Management Journal, 14*(2), 103-124.

Reich, A. (2000). *Learning organisations: post-fordist heavens?* Paper presented at the Working Knowledges Conference, Sydney, Australia.

Riessman, K. (1993). *Narrative analysis. Qualitative research methods* (Vol. 30). Newbury Park, CA: Sage Publications.

Roth, G. (1996). *Learning histories*. Center for Organizational Learning, Sloan School of Management. Retrieved September 22, 2003, from the World Wide Web: http://www.sol-ne.org/res/wp/18004.html

Roth, G. (2000). Constructing conversations: Lessons for learning from experience. *Organization Development Journal, 18*(4), 69-78.

Rouse, M., & Daellenbach, U. (1999). Rethinking research methods for the resource-based view perspective: Isolating sources of sustainable competitive advantage. *Strategic Management Journal, 20*, 487-494.

Sandberg, J. (2000). Understanding human competence at work: An interpretative approach. *Academy of Management Journal, 43*(1), 9-25.

Sanger, D. (2003, August 27). Inertia and Indecision at NASA. *New York Times.*

Sarroub, L. K. (2001). The sojouner experience of Yemini American high school students: An ethnographic portrait. *Harvard Eductional Review, 71*(3), 390-415.

Schied, F., Carter, V., Preston, J., & Howell, S. (1998, March 21). *Knowledge as "quality non-conformance": A critical case study of ISO 9000 and adult education in the workplace.* Paper presented at the Pennsylvania Adult & Continuing Education Research Conference, Widener University, Chester, PA.

Seale, C. (1999). *The quality of qualitative research.* London, Thousand Oaks, New Delhi: Sage Publications.

Senge, P. (1990). *The fifth discipline.* New York, NY: Doubleday.

Senge, P., Cambron-McCabe, N., Lucas, T., Smith, B., Dutton, J., & Kleiner, A. (2000). *Schools that learn: A fifth discipline fieldbook for educators, parents, and everyone who cares about education.* New York, NY: Doubleday.

Senge, P., Kleiner, A., Roberts, C., Ross, R., Roth, G., & Smith, B. (1999). *The dance of change: The challenge to sustaining momentum in the learning organization.* New York, N.Y.: Doubleday.

Senge, P., Kleiner, A., Roberts, C., Ross, R., & Smith, B. (1994). *The fifth discipline fieldbook: Strategies for building a learning organization.* New York, NY: Doubleday.

Stake, R. E. (1995). *The art of case study research.* Thousand Oaks CA: Sage Publications.

Storper-Perez, D., & Goldberg, H. (1994). The kotel: Toward an ethnographic portrait. *Religion, 24*(4), 309-332.

Sutcliffe, K. M., & Huber, G. P. (1998). Firm and industry as determinants of executive perceptions of the environment. *Strategic Management Journal, 19*(8), 793-807.

Tedlock, B. (2000). Ethnography and ethnographic representation. In N. K. Denzin & Y. S. Lincoln (Eds.), *Handbook of qualitative research* (Second ed., pp. 455-486). Thousand Oaks, London, New Delhi: Sage Publications Inc.

Thomas, J., Sussman, S., & Henderson, J. (2001). Understanding "strategic learning": Linking organizational learning, knowledge management, and sensemaking. *Organization Science, 12*(3), 331-345.

Tight, M. (2000). Critical perspectives on management learning. *Management Learning, 31*(1), 103-119.

Vaughan, D. (1990). Autonomy, interdependency, and social control: NASA and the space shuttle challenger. *Administrative Science Quarterly, 35*(2), 225-257.

Walsh, J. (1995). Managerial and organizational cognition: Notes from a trip down memory lane. *Organization and Science, 6*(3), 280-321.

Weaver, L. (2000). *My first real fire.* Retrieved April 12, 2004, from the World Wide Web: http://www.firefighterexchange.com/Structure/StructureStory12.html

Weick, K., & Quinn, R. (1999). Organizational change and development. *Annual Reviews of Psychology, 50*, 361-386.

Weick, K., & Sutcliffe, K. (2001). *Managing the unexpected.* San Francisco, CA: Jossey Bass.

Weick, K., & Westley, F. (1996). Organizational learning: Affirming an oxymoron. In S. Clegg & C. Hardy & W. Nord (Eds.), *Handbook of organizational studies*. London: Sage.

Wernerfelt, B. (1984). A resource-based view of the firm. *Strategic Management Journal, 5*, 171-180.

Wheatley, M. (1992). *Leadership and the new science: Learning about organization from an orderly universe.* San Francisco, CA: Berret-Koehler.

Wheatley, M., & Kellner-Rogers, M. (1996). Self-organization: The irresistible future of organizing. *Strategy and Leadership*(July/August), 18-24.

Whitehead, A. N. (1967). *Adventures of ideas*. New York and London: The Free Press a Division of Macmillan Publishing Company.

Wood, T. (2000). *I wish you could know*. Retrieved April 12, 2004, from the World Wide Web: www.firefighterexchange.com/Misc/Prayer1.html

Yanow, D. (2000). Seeing organizational learning: A 'cultural view'. *Organization, 7*(2), 247-268.

Yin, R. (1984). *Case study research: Design and methods.* Beverly Hills, CA.: Sage Publications.

APPENDIX A

"Examining Knowledge Creating Activity"
Participant Consent Form

I, ____, agree to participate in a research project exploring how organizational learning is perceived and disseminated in this organization.

I, agree to be observed and interviewed by the researcher, Mark Biddle, under the following conditions:

1. I have the right to withdraw from any activity in this project up until thirty days after the completion of fieldwork. If I choose to do so, the information I provide will be returned to me and no used in the project.

2. I agree to an initial single interview and a possible follow-up interview each approximately sixty (60) minutes in duration.

3. I understand that the interview will be transcribed and that tapes and transcripts will not be shared with anyone besides the researchers.

4. My identity will be kept confidential and a personal reference will be removed in any scholarly articles or presentations that report the study findings.

5. The researchers will endeavour to ensure that no harm will come to me through my participation in this project. No deception will be used in this study.

I agree to these conditions:

Signed____
Date____

Researcher
Signed____
Date____

For further information regarding the purpose and methods of this project, feel free to contact the principal researcher:

Mark Biddle, University of Alberta, Department of Educational Policy Studies
mbiddle@ualberta.ca
Advisor, Dr. Tara Fenwick, University of Alberta, tara.fenwick@ualberta.ca

APPENDIX B

"Examining Knowledge Creating Activity": Interview questions

I am interested in understanding a noticeable learning event in your organization. A noticeable learning event includes the conditions that help an organization disseminate and utilize new lessons learned. In order to gain this understanding I'd like to ask you a few questions about learning in your organization and how the organization has disseminated new lessons.

1. Would you describe your position in the organization? How long have you worked here?

2. Would you describe a recent learning event that has occurred in your work setting? By learning event I mean something that either required you to adapt to a changing situation or something new that was introduced that involved some learning. [Senge (1990) described two kinds of organizational learning: adaptive and generative.]

    a. Would you describe the learning process as formal or informal? Formal are those events that are scheduled, have set written materials, or have specific goals. Informal events are the surprises that may have happened, the conversations over coffee, and other ways that you learned.
    b. In what settings did the informal learning occur? The formal?
    c. What were the consequences of the informal learning in terms of changes or other outcomes in the organization?
    d. Tell me how you have experienced changes in commitment by the organization to organizational learning?

3. Did you experience a process in which individual insight was shared with the organization?
    a. How did this happen?
    b. How did the organization respond?
    c. How did the organization come to understand and agree about the learning that occurred?

4. What procedures were used to disseminate new lessons learned across the organization?

5. What are some of the challenges in problem solving and decision-making issues that you have experienced?

6. Thanks for your participation. Are there any other comments you might like to add?

APPENDIX C

Culture		
Code: person interviewed (:) page number of transcript (.) Line in transcript (if indicated) + indicates complete page * Indicates the number of different persons responding and not the number of responses		
Move from government	Trust in Community	In the midst of Change
Leave government 1:12.12; 4:2; 4:4; 5:8; 19:7; 8: +; 9:1,4; 3:1; 17:5; 14:1; 18	Cooperate in crisis 1:27.1; 6:5; 9:9; 18:12	learning institution vs. business 14:1
"show them" 16:19 Meet client needs 2:3.22; 19:8; 2:4,19; 3:14; 4:17-1 Customer is family guest 3:17,18	Tight knit 3:1; 10:8, 19:6; 6:9Never an institution 5:8 family: 16:21,28Trust 7:10; opinion valued 17:10; watch out for another 11:14	get on better with one another 14:21 Union to Association 1:16.12;17:+ Constant change2:1; 5:*
VMV 8:2; 16:1, 16:22 Excellence2:17.5; 19:13	Team 10:8 pride17:8 Infractions 5:5	overcoming mindset14:10 watching 11:14
Feedback11:9 Staff have input 5:12; 8:+	Efficient 12:4 saving money 10:23, 10:25	experience in fire fighting12:4
	Learn by Exp. 10:13	Growth in #'s 1:13; 3:+
Leadership 4:2; 6:14; 8:+	Familiar Ops/rules 3:1	Pushed to limit 2:22.11
Best place 1:2.17; 10:7,15	Face to Face Training 10:13 Fun 5:14;16:28; 12:4;13:9	balance 11:14
Modules 11:16	Christmas Meeting: 8:4	bring out the best 1:32.45
Relationships (work) 4:12 (respect not buddies)	Personal relations 4:10 Safe as a person 8:2	Attract employees1:18.10 Want to be here 18:18
Do things better 3:3 Get organized 3:3, 8	Don't like rules 2:20.19; Policies not written 5:15;	Too busy working for extra learning 4:20-22;
	Avoid disciplinary action1:14.38; 19:7	Adventure 17:7, 10 flexible 6:17
	Staff earn dollars 4:21	Work under pressure 6:14
Shared budget +/- 6:17	Christmas/team meetings	
Levels of staff 18:6; 18:11	can't adapt you leave 12:2 Wolves 17:11	flexible 13:10 1st impression 12:1
Name change 17:19; 19 Corporate wear17:19; 19 Old versus new 18:4	Support for individual 5:5; 10:8; 10:10; 19:15; Ask for what you need 11:9	How are we doing? 12:26
46 references/ 17 persons*	41 reference/ 17 persons*	22 references/ 12 persons*

APPENDIX D

Coordinated Teams person interviewed (:) page number of transcript (.) Line in transcript (if indicated) * indicates the number of different persons responding and not the number of responses		
Assumptions about decision-making	Management Network16:1 Empowerment12:11; 12:12 Blurring 3:4 Worst thing no decision-making 5:17; 11:6-7 Accountability 14:2; 10:3, 10:13; 17:16	10 references/ 8 persons*
Recognizing interconnected practices	Awareness 3:5; 17:12-13; 4:4-5 ; 13:21 Autonomy 8:3; 17:14; 19:6 Accounting 5:1 Calendar 3:5; 17:12-13; 19:5 Bylaws 1:16	12 references/ 8 persons*
Developing Improved practices of communication Improving individual communication skills	Prof. Develop 4:8; 4:10; 11:13; 18:14; 4:7 Tone 9: 13 Timeline 11:7 Relationship skills 4:17; 8:2; 8:7; 1:35 Staff input 5:12 Open Door 1:30 Investigation 4:6 Marketing 3:4 People Soft 10:3; 17:6	14 references/ 9 persons*
learning to make collective decisions	Improvement 11:13; 8:2; 8:7 Community11:11; 17:10-12; 18:21 Industry 3:2	(collective decisions) 10 references/ 7 persons*
		46 references/ 15 persons*

APPENDIX E

Organizing Services Code: person interviewed (:) page number of transcript (.) Line in transcript (if indicated) * indicates the number of different persons responding and not the number of responses		
Strategic decision-making	Fireworks (Think Tank)1:30; 16:6; 16:16; 19:7-8 Creation 16.2; Booking 9:4; 12:17 Environment16:17 Motto 16:27 More with less11:18	10 references/ 6 persons*
Nested networks	SAM 16:3; 16:6-7; 16:18; 17:15; 18:21; 9:16 Email 11:11; 12:26 Remote access6:4 VPN 6:6	10 references/ 7 persons*
Re-jigging	Mentor 4:11; 4:16 Needs 12: 2 Creation 16:2 Fuel consumption 16: 18 Inventory 16: 5 Not an instructor 9:6 Greater need 16:4	8 references/ 4 persons*
total		28 references/ 11 persons*

APPENDIX F

Change to Modular Course Code: person interviewed (:) page number of transcript (.) Line in transcript (if indicated) * indicates the number of different persons responding and not the number of responses		
Strategic decision (to offer a modular format)	Modules 2:9.3; 2:10.4, 2:18, 2:19.15; 4:5; 13:8; 13:3; 14:10; 17:16 Future need 2.1; Advisory Bd. 2.9; 14.9 JPR/Standard 2:15; 4:5; 14:6;18:15 Info cycle 3:10; 14:4 (who needs to know?) National excellence 2:17	19 references/ 7 persons *
Nested network	Conflict 9:19 Stress 9:9; 18.21 Increase course 2:4-5; 4:7; 11:13; 18:14; 9:2; 9:5; 17:3 Email 2.2 Lesson plan to module 14.7; CD 2:11 File management 6:9 On line provision 6.17; 9.22 Lakeland 2:19; 2:20; 2:26; 9:2	20 references/ 8 persons*
Re-Jigging	Protect 4:14 Plagiarism 14:18, 19 Scanning 2: 7, Revisions 2:12 Book learned 4:7 vs. amount of field experience 4:14 Cut meat and muscle18: 14; Forget 17:17 Bumps 18:6 New 13:13 Share 14:3 Non-municipal student 17:18	12 references/ 8 persons*
Total		51 references/ 9 persons*