The Value of Human Resource Development to an Organization; Providing Technical Assistance to Small Manufacturing Companies

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Valuing Human Resource Development in an Organization; Providing Comprehensive Technical Assistance Services to Small Manufacturing Companies

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ABSTRACT

Modernization of manufacturing means updating capabilities and changing the ways in which companies organize and manage processes, produce their product, and hire, train, and retain their personnel. Often referred to as "high performance," these qualities are characterized by worker training and development, continuous improvement, ongoing information sharing, and worker discretion and autonomy. They are equally applicable to small, medium-sized, and large manufacturing firms. While many barriers exist that challenge small manufacturers to move from their traditional operations to high performance, those that are able to operate in this mode have demonstrated success.

In 1988, Congress passed the Omnibus Trade and Competitiveness Act which charged the National Institute of Standards and Technology (NIST) to help smaller manufacturers adopt and apply performance-improving technologies as needed to meet the intensifying domestic and global competition in manufacturing. NIST established the Manufacturing Extension Partnership (MEP) program to create and implement a nationwide system of technical assistance centers, staffed by knowledgeable manufacturing and other business system professionals, to enable small and medium-sized manufacturers reach this goal.

Each of the 78 MEP center's individuality results from its respective charter, which, in turn, reflects the needs and priorities of its stakeholders, location, and client firms. As providers of services that help small manufacturing firms become more productive in all of their functions, MEP centers can influence their client firms' evolution towards high performance, which would include a focus on training and other flexible work practices. Yet, not all of the MEP centers report that they provide technical assistance in human resource-related activities to their client firms. In fact, some of the centers report no assistance in this topic area at all. This study attempted to understand why some MEP centers do not place a high value on training and other flexible work practices as critical components of the services they provide to their client firms.

I conducted qualitative case studies of three MEP centers whose inclusion of training and other flexible work practices to their client firms ranged from none to integration with all services. Applying grounded theory analysis techniques, I identified experiences, training, and organizational policies that have either enabled or discouraged these service providers from offering a comprehensive, holistic range of services to their client firms. The data yielded four constructs that are common to the three centers and explain their involvement with human resource-related activities: (1) control; (2) discrepant values and behaviors; (3) limited definitions of training and development; and (4) experiences. The four constructs formed the basis of the analyses of the three centers. The constructs also contributed to a model for identifying interventions to assist MEP centers and their staffs transition from solely technically-oriented assistance to more holistic approaches.

Acknowledgments

Writing this part of the dissertation has been my goal for a very long time, because I thought it would mean that I was done. Others' acknowledgments intrigued me, often causing me to wonder how it would feel to be finished. And now I've reached that point myself...finally. I'm surprised to find that my feelings are mixed: *relief,* first and foremost; *heartfelt gratitude* for so many people's assistance and support; *hopeful* that I've added some useful information to my area of practice; but *overwhelmed* by the realization that it's never really complete. Just done for now.

I am very grateful to the MEP Center stakeholders who willingly, thoughtfully, and generously shared their experiences, ideas and values with regard to training and other flexible work practices. I learned far more from them than the data I needed to complete this dissertation.

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CHAPTER I: INTRODUCTION

Background of the Problem

Manufacturing modernization means updating capabilities and changing the ways in which companies organize, manage, produce, and hire, train, and retain their personnel. Modernization is about converting from the mass production strategies popularized in the 1920s to new strategies that are better suited to meeting the demands of today's marketplace. Therefore, these new strategies are better able to support long-term company and job viability. As a provider of technical assistance to small manufacturing companies interested in becoming more modern, the Manufacturing Extension Partnership at the National Institute of Standards (1995) identified aspects of the transition to modernization:

> Capital increasingly crossed national borders, enabling foreign competition to make unprecedented investments in plant and equipment. As a result, sophisticated competitors emerged globally in almost every manufacturing industry....[Customers'] tastes became more sophisticated, their demands for quality and variety increased over time. As a result, low-cost production was still an important, but no longer a sufficient variable for manufacturing success. Added to the mix were demands for quality, customization, and speed-to-market. As a result, flexibility, shop-floor innovation, and market responsiveness became just as important as productivity (NIST MEP Workforce Initiative Strategic Plan, 1995, p. 1).

Along with the changes in manufacturing processes and priorities came the realization that the necessary flexibility could be best achieved through skilled workers with knowledge of the technical aspects of production, as well as the abilities to attain maximum effectiveness within the company. The result has been a shift with regard to the workforce and workplace strategies that help to ensure manufacturing success, requiring a greater emphasis on education and training to provide workers with the capabilities to address continuous change. According to the Malcolm Baldrige National Quality Award criteria, the new aim of job design and work organization is to "enable employees to exercise more discretion and decision making, leading to greater flexibility and more rapid response to the changing requirements of the marketplace" (Malcolm Baldrige National Quality Award Criteria, 1995). Other elements identified as "high performance" in the workplace include training and education; worker discretion and autonomy; worker involvement and teamwork; continuous information sharing; and performance-based compensation systems (Commission on the Skills of the American Workforce, 1990; Bishop, 1994; Huselid, 1994; Pfeffer, 1994, 1998).

High Performance Work Organizations

The current literature frequently uses the term "high performance work organizations" to describe the characteristics of firms that will best be able to meet their customers' ever changing

demands. Jarboe and Yudken (1997) identified the goals of high performance work organizations:

> A high performance work system seeks to enhance organizational performance by combining innovative work and management practices with reorganized work flows, advanced information systems, and new technologies. Most important, it builds on and develops the skills and abilities of fronting workers to achieve gains in speed, flexibility, productivity, and customer satisfaction (p. 65).

Huselid (1995) identified the characteristics of high performance work practices: "... extensive recruitment, selection and training procedures; formal information sharing, attitude assessment, job design, grievance procedures, and labor-management participation programs; and performance appraisal, promotion, and incentive compensation systems that recognize and reward employee merit" (p. 640). Hayes, Wheelwright, & Clark (1988) claimed that developing the potential of workers in an organization "...is at the heart of high-performance manufacturing" (p. 242).

Among the many studies of aspects of high performance work organizations are a few cited below:

- Osterman (1994) conducted a survey of internal labor market (ILM) innovations in a wide range of American companies, all private sector establishments with 50 or more employees. He surveyed the most senior person in a location in charge of production of goods and services to ensure that he was gaining the best information available about the organization from the employee's point of view. He found about 35% of the respondents (he had a nearly 66% response rate) appear to have made substantial use of flexible work organization in 1992, possessing a set of human resource management (HRM) practices that endorse the adoption of flexible work systems, i.e., "... innovative pay schemes, extensive training, and efforts to induce greater commitment on the part of the labor force" (p. 186). Employment security was not as important to most workers as he originally hypothesized, providing an anomaly in some of the high performance accepted beliefs. Osterman recommended more research to understand "...the range of practices and the direction of change" (p. 186).

- Bartel conducted a study of 155 manufacturing firms and found that those firms that introduced formal training programs after 1983 experienced a 19 percent increase on average in productivity on average over the next three years than firms that did not introduce training programs (Bartel, 1994).

- Huselid (1996) studied a wide range of industries and firm sizes and found that investments in high performance work practices yielded lower employee turnover and greater productivity and corporate financial performance. Specifically, "[a] one standard-deviation increase in such practices is associated with a relative 7.05 percent

decrease in turnover and, on a per employee basis, $27,044 more in sales and $18,641 and $3,814 more in market value and profits, respectively" (p. 667).

- Arthur (1994) conducted a study that hypothesized higher productivity, lower turnover, and a negative relationship between turnover and manufacturing performance in companies with commitment, rather than control human resource systems. He found "... significant differences between the two types of systems in both turnover and the relationship between turnover and manufacturing performance" (p. 683), confirming a conceptual model "...in which the choice of human resource system leads to changes in manufacturing performance" (p. 684).

- Pfeffer (1998) identified seven basic people management practices that contribute to firms' competitive advantage: employment security, selective hiring, self-managed teams and decentralization, extensive training, reduction of status difference, sharing information, and high and contingent compensation. His studies of successful firms, i.e., firms that have demonstrable and extended profitability and productivity, attributed their success to their high performance practices that "put people first" (p. 300). He identified the following specific performance results: innovation, flexibility, customer services, productivity, cost reduction, and learning and skill development (p. 301).

Small and Medium-Sized Companies

As convincing as the arguments for high performance may seem, companies are slow to adopt them, especially small companies. Typically, they do not have the knowledge, tools or resources for implementing these systems. Plus, their priorities are understandably focused on meeting payroll, not longer term issues such as work organization or worker training.

The National Research Council (1993) identified five barriers to manufacturing performance improvement in smaller firms:

- Barrier 1: Disproportionate Impact of Regulation – National, state, and local initiatives and decisions concerning trade, the environment, employment, work place safety, health care, and liability have a direct impact on the competitiveness of manufacturing companies... One result is that the economic impact of regulatory compliance is much greater as a percentage of capital investment than it is for larger businesses.

- Barrier 2: Lack of Awareness – Smaller manufacturers are often unfamiliar with changing technology, production techniques, and business management practices.... As a consequence those companies are less likely to be aware of the best manufacturing practices, innovative application of new technologies, and fresh approaches to improved production efficiency...they are less likely to risk investment in new ways of doing things or in major changes to the management structure and relationships within the business.

- Barrier 3: Isolation – Smaller manufacturers are generally isolated and have too few opportunities for interaction with other companies in similar situations. Interaction with other firms is essential to continuous improvement.

- Barrier 4: Where to Seek Advice – It is difficult for owners and managers of smaller companies to find high-quality, unbiased information, advice and assistance... Search for help in the public sector often reveal a confusing uncoordinated array of services – universities, economic development groups, technical schools, government agencies – 'competing' for clients.

- Barrier 5: Scarcity of Capital – Operating capital and investment funds for modernization are difficult for small and medium-sized manufacturing firms to obtain. The financial community does not readily understand manufacturing and often perceives loans for new equipment as unattractively high risks" (pp. 4-6).

These barriers constitute a partial cause for the creation of the Manufacturing Extension Partnership (MEP) program at the National Institute of Standards and Technology (NIST) in 1988, a network of independent, non-profit manufacturing extension centers and field offices throughout the United States. (NIST is a non-regulatory agency of the U.S. Department of Commence.) The mission of the centers is to strengthen the global competitiveness of smaller U.S.-based manufacturing firms by assisting in the adoption of advanced technologies, techniques and business practices. Centers provide local access to information, decision support, and implementation assistance of client firms in adopting new, more advanced manufacturing technologies, techniques, and business best practices.

According to Shapira (1998), "Manufacturing extension centers typically employ industrially experienced field personnel who work directly with firms to identify needs, broker resources, and develop appropriate assistance projects" (p. 46). The MEP system has enabled public and private sector partners to facilitate the technology diffusion process. Initially, some critics were concerned that the MEP centers would compete with private consultants, even though most small companies cannot afford the fees charged by private consultants. In fact, rather than compete, MEP centers have helped small manufacturing companies to use the services of consultants more effectively, working with them to implement the consultants' recommendations (Shapira, p. 46).

Technical Assistance at the National Level

In 1988, the U.S. Congress passed the Omnibus Trade and Competitiveness Act[1] which directed the national institute of Standards and Technology (NIST) to being helping the nation's smaller manufacturers adopt and apply performance-improving technologies as needed to meet intensifying domestic and global competition in manufacturing. An agency of the Department of Commerce's Technology Administration, NIST was selected for this role because of its expertise in manufacturing engineering and its long-standing tradition of productive partnerships forged with public and private organizations at the national, state and local levels.

NIST established the MEP program in 1988 to help carry out this charge. A small staff based at NIST headquarters in Gaithersburg, MD, provided technical assistance to three extension centers that were affiliated with and housed in existing technology-based organizations or institutions to supplement and complement the services they were giving to small manufacturers in their respective regions. The first three centers were the Cleveland Advanced Manufacturing Program; the University of South Carolina (later managed by Enterprise Development, Inc.; and Rensselaer Polytechnic Institute (later transferred to the New York State Science and Technology Foundation).

In 1990, two more centers were awarded – the Industrial Technology Institute in Ann Arbor, MI, and the Kansas Technology Enterprise Corporation in Topeka, KS. In 1992, funds for two more centers were awarded to Minnesota Technology, Inc., in Minneapolis/St. Paul and California Community Colleges in Los Angeles (National Research Council, 1993). The primary focus at that time was technology transfer, i.e., ensuring that small manufacturing enterprises

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[1]Title 15 of P.L. 100-418, the Trade and Competitiveness Act of 1988, Section 278 (k), Part (a) authorizes creation of "regional Centers for the Transfer of Manufacturing Technology." Within that authorizing legislation, the objective the centers is stated as follows:

"...the objective of the Centers is to enhance productivity and technological performance in United States manufacturing through:

(1) the transfer of manufacturing technology and techniques developed at the Institute to Centers and, through them, to manufacturing companies throughout the United States;
(2) the participation of individuals form industry, universities, State governments, other Federal agencies, and, when appropriate, the Institute in cooperative technology transfer activities;
(3) efforts to make new manufacturing technology and processes usable by United States-based small- and medium-sized companies;
(4) the active dissemination of scientific, engineering, technical, and management information about manufacturing to industrial firms, including small- and medium-sized manufacturing companies; and
(5) the utilization, when appropriate, of the expertise and capability that existing in Federal laboratories other than the [National] Institute {of Standards and Technology]."

(SMEs) had as much access to the latest information and techniques pertaining to manufacturing as the large, successful companies had.

Since that time, NIST MEP has provided federal oversight as the MEP network has grown to include extension centers in every state, plus Puerto Rico. Each MEP center was established as a result of a rigorous competitive process. Each is an independent entity with 501c.3 status.[2] Approximately one-third of individual centers' funding is provided by the federal government, under the auspices of NIST MEP. The remainder of the funding is a combination of state appropriated, local level, or fee-for-service. Different centers have different funding sources and formulas, depending upon rules that may be imposed by their respective state legislatures, their fee structures, or their co-location with a partner organization.

In addition to participating in the selection process, NIST MEP's activities include helping foster a unified system among the MEP centers by identifying and coordinating the services, technology and information needed at a national scale. NIST MEP has developed a uniform system to help centers evaluate and continuously improve the success of services they deliver, also. In Fall 1998, NIST MEP introduced the MEP Criteria for Center Performance Excellence to guide MEP centers towards performance excellence. This new evaluation system is based on the seven categories of the Malcolm Baldrige National Quality Award; it identifies functional areas in which all high performance centers will excel. In MEP parlance, the seven criteria are: Center Leadership; Center Planning; Center Customer Knowledge and Relationships; Center Performance Information and Analysis; Center Workforce Practices and Work Environment; Center Process Management; and Center Performance.

Presently, NIST MEP consists of a network of services that assist the MEP centers to best serve their clients – SMEs – to increase their levels of modernization to become increasingly globally competitive. That goal is their federal mandate. To accomplish this goal, the MEP system partners federal support with state and local organizations. Services are locally driven so that they can address the specific needs of area manufacturers. At the same time, NIST MEP is developing common tools and resources to address recurring and consistent challenges faced by all manufacturers nationwide, e.g., recruiting and hiring new workers who can replace those who are retiring.

To increase the breadth and depth of capabilities at each center and of the entire network (always with the goal of improving access for smaller manufacturers to public and private sector

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[2]The organizations described in 501(c)(3) of the Internal Revenue Code must have been created for the following tax exempt purposes: charitable, religious, educational, scientific, literary, testing for public safety, fostering national or international amateur sports competition, and the prevention of cruelty to children or animals. In addition, a 501(c)(3) organization may not engage in carrying on propaganda, or otherwise attempting, to influence legislation as a substantial part of its activities (from the World Wide Web: <http://www.fourmilab.ch/ustax/www./t26-A-1-F-501.htm>).

resources), NIST MEP and the individual centers have developed relationships with nearly 700 affiliate organizations. Among these partners are non-profit technology or business assistance centers, non-profit economic development organizations, community colleges and technical schools, private consultants, universities and four-year colleges, and federal agencies. To date, about half of the centers have ties to industry associations.

Developing working linkages with other organizations in support of the entire extension network is also a high priority. For example, with the U.S. Environmental Protection Agency, NIST MEP launched a program aimed at helping smaller manufacturers solve environmental concerns in the most cost-effective manner before they become problems requiring regulatory or compliance action. Other strategic partners include the National Governors Association, the National Alliance of Business, and the American Society for Training and Development. NIST MEP continues to conduct research to better understand the barriers small firms face in modernizing and in finding new services, products, and delivery systems to help them overcome these hurdles. Also, NIST MEP is exploring new partnerships with organizations that have a stake in manufacturing modernization and new technology to help smaller manufacturers take advantage of electronic information and communications.

Technical Assistance at the Extension Center Level

MEP centers are designed to help link sources of improved manufacturing technology with the small and mid-sized companies that need it. MEP center staff work with individual companies or with groups of companies organized around common needs, industries, or technologies. All centers rely on experienced field staff who provide the companies with on-site advice and/or practical assistance. That is, some of the centers provide the service on their own; others conduct assessments of the clients' needs and broker the services via other providers. The MEP centers are governed by local boards of directors. Their funding is typically derived from a combination of federal, state, and local sources. Most of the MEP centers charge fees for their services to their clients, although some provide their services free-of-charge.

While each center tailors its services to meet the needs dictated by its location and manufacturing client base, some common services are offered by most extension centers. Broadly, these include helping manufacturers assess their current technology and business needs, define avenues for change, and implement improvements. Working with other federal, state, or local organizations, including private sector consultants, many centers also assist companies with such issues as quality management, workforce training, workplace organization, business systems, marketing, or financial issues. The MEP centers are similar to their small business clients in that they average fewer than 20 employees, they provide services to their clients, and they often lack professional managers on their staff. Indeed, many of the centers can be likened to "mom and pop" operations themselves. NIST is encouraging them to become more efficient in their operations, but just as they are charged with helping their clients move towards "high performance," they are attempting to move toward high performance themselves.

Statement of the Problem

This study addresses workforce and workplace aspects of the MEP system. An educated and trained worker is frequently acknowledged as one of the most critical elements for a company's becoming and remaining competitive. Certainly, implementing a high performance work organization is dependent on such a worker. Therefore, a company's strategic planning should include a human resources plan to ensure that human resource practices are aligned with the company's strategic goals. A recent report published by the American Society for Training and Development explained succinctly, "Employees need new skills, more skills and adaptable skills. The critical question, therefore, is no longer 'why,' but 'how': How can organizations keep up with the fast pace of change in fulfilling this need for skills?" (McCain and Pantazis, 1997, p.1).

MEP centers are acknowledged providers of technical assistance for small and medium-sized manufacturing companies, providing these firms guidance on all aspects of modernization with a goal of increasing their competitiveness. Yet, just as only some firms include human resource development as an integral part of their strategic planning processes, only some MEP centers offer either assistance to client companies or training to their own field agent staff in the issue areas associated with human resource development. Their definitions of technology are quite traditional, as opposed to the definition created by Branscomb (1993): "Technology is the aggregation of capabilities, facilities, skills, knowledge, and organization required to successfully create a useful service or product" (p. 3). Indeed, some centers consciously avoid becoming involved in any aspect of their client companies' people practices.

As a result, the People Systems work unit at NIST MEP is attempting to raise the awareness of MEP center staff to workforce issues, based on the assumption that improvements in manufacturing processes can only be implemented and sustained if workers are trained and engaged in those processes. To provide those services to their client firms, MEP centers must be prepared to develop a comprehensive perception of a company and its workers. This process may be a slow one for the centers to endure.

Currently, a system that has been created for the purpose of providing technical assistance to the greatest number of contributors to the country's manufacturing base is providing only partial solutions to their client companies' problems. By ignoring the human resource-related problems characterizing their client firms – either through a lack of awareness or purposeful omission – MEP centers are neglecting an element known to be necessary to a firm's success. In this age of holistic approaches and systems building, ignoring these issues renders the firm's practices incomplete.

Purpose of the Study

This study attempted to understand why some MEP centers, a network of technical service providers who offer technical assistance services to small manufacturing clients, place a high value on training and other flexible work practices as a critical component of successful companies' functions, while others do not. I wanted to identify a continuum of behaviors that resulted in their offering training and other flexible work practices and, therefore, expanded their definition to be more reflective of Branscomb's definition of technology cited earlier, "...the aggregation of capabilities, facilities, skills, knowledge, and organization required to successfully create a useful service or product" (Branscomb, 1993, p. 3).

As providers of technical assistance to SMEs, MEP centers can influence their client firms' evolution toward high performance work organizations. Those centers that possess this value demonstrate awareness of, provide references for, or include human resource-related technical assistance in the array of services they offer their client companies. They work to keep their field staff abreast of human resource issues, which, in turn, enable the field staff to provide their client firms with services in these areas directly, or refer them to appropriate service providers.

Centers that do not emphasize human resource development, on the other hand, are focused on the more traditional aspect of manufacturing extension, e.g., quality control, plant layout, or inventory control. They ignore issues pertaining to worker hiring, training, and retention, declaring those issues to be unrelated to their technology-focused mission. Indeed, they may echo their client firms' concerns about a lack of future workers to replace the retiring corps, yet they do not help their clients to address the problems.

I applied the responses to the questions regarding why some centers do and some do not provide services related to training and human resources to their client firms to the development of a case study for each of three selected MEP centers. The case studies informed the development of a model that demonstrates the learning and decision making processes that occur before a technical assistance providing organization expands its practice to include training and other flexible work practices and possible interventions for encouraging that process.

Research Questions

My research focused on understanding why some MEP centers do place and some do not place a high value on services pertaining to workforce development, i.e., training and human resource development, in their provision of services to their client firms. The following questions serve as the focus for the study:

1. What are the circumstances, i.e., events, policies, attitudes, that either encourage or discourage a holistic approach for small manufacturing clients?

2. What are the espoused values of MEP center staff who support training-related assistance? What are the sources of these values?

3. What are the espoused values of MEP center staff who do not support training-related assistance? What are the sources of these values?

4. What cognitive processes account for valuing or discounting learning interventions?

Significance of the Study

A goal of NIST MEP is to build all MEP centers' understanding of the importance of workforce development and human resource issues to companies' success, while ensuring that client firms' modernization needs are being met. Understanding the developmental processes that centers must experience before they place a high value on training and other flexible work practices will provide NIST MEP with helpful information for revising their strategic and operational planning regarding the infusion of human resource issues in more MEP centers. Developing a model that explains the process of valuing training and other workforce-related services will enable the process of transitioning centers that do not include human resource technical assistance services for their client firms towards those that do offer such services. On a broader level, this understanding will provide helpful information to human resource professionals attempting to broaden the scope of existing programs that are high on technology and low on the so-called "softer skills" in order to ensure that all workers are prepared to meet the continually evolving changes in their workplace.

Method

I chose a qualitative case study as the most appropriate means for gathering data, because of the study's focus on the "why" of the issue: Why do some MEP centers value human resource development issues in their interactions with their client firms while others do not?

Yin (1994) distinguished between the kinds of questions answered by quantitative and qualitative research. "[T]he first and most important condition for differentiating among the various research strategies is to identify the type of research question being asked...'How' and 'why' questions are likely to favor the use of case studies, experiments, or histories" (p. 7). This concept was corroborated by Merriam and Simpson (1995) who differentiated case studies from other forms of research based on their focus on multiple variables in a single unit, rather than a few variables across numerous units. Finally, Merriam (1988) indicated that qualitative research is selected when "...insight, discovery and interpretation" are more appropriate to a study than the testing of hypotheses" (p. 10).

My research was conducted iteratively. That is, the first case study is very comprehensive in the numbers of stakeholders interviewed, the amount of documentation studied, and the quantity and quality of data analyzed. The case studies for Centers Two and

Three were not as comprehensive as the first center's. I interviewed fewer people in each of those centers, because the interviewees provided information that repeated data gathered from Center One. Per Strauss and Corbin (1998), "...the research finds that no new data are being unearthed. Any new data would only add, in a minor way, to the many variations of major patterns" (p. 292).

I selected Center One because it reported zero human resource activities to NIST. However, I found that the interviewees placed some value on training and other flexible work practices, even if they minimized those skills in their portfolio of services for their client firms. Therefore, for the second case study, I selected a center that does include training and other flexible work practices in an attempt to understand why there are differences between their two practices. Since Centers One and Two are relatively new to the MEP system, I selected Center Three because it was one of the first centers selected in the MEP system and reports some training and other flexible work practices to NIST. I wanted to see how an established center was preparing its field staff to transition towards providing more holistic services to client firms.

Through the use of grounded theory methods (Strauss and Corbin,1990,1998), I identified four constructs that are common to the three centers. The constructs were the basis for a model that describes the developmental process for making the transition from traditional technical assistant to a provider of holistic services.

Definition of Terms

Flexible Work Practices: Workplace policies, programs, and practices characterized by a perspective that emphasizes employees as important contributors to the firm's success. Examples of flexible work practices include: ongoing and appropriate training, open communication, opportunities for employee inclusions, self-directed work teams, and fair compensation and benefits.

High Performance Work Organizations: A high performance work system seeks to enhance organizational performance by combining innovative work and management practices with reorganized work flows, advanced information systems, and new technologies. Most important, a high performance work organization builds on and develops the skills and abilities of frontline workers to achieve gains in speed, flexibility, productivity, and customer satisfaction.

Human Resource Development (HRD): HRD is a function in an organization that provides opportunities for an individual worker to improve current and future job performance, while simultaneously best utilizing human capital in order to improve the efficiency of the organization itself. Ideally, well-developed and well-implemented HRD systems are integral to the company's strategic plan and benefit both the employee and the company.

Manufacturing Extension Partnership (MEP): One of four programs of the National Institute of Standards and Technology (NIST), MEP is a nationwide system of services and support to strengthen the global competitiveness of the 380,000 small U.S.-based manufacturing firms with

500 or fewer employees. The partnership is a network of independent, non-profit manufacturing extension centers and field offices throughout the U.S. that provide local access to information, decision support, and implementation assistance of client firms in adopting new, more advanced manufacturing technologies, techniques, and business best practices.

National Institute of Standards and Technology (NIST): NIST is a non-regulatory federal agency within the U.S. Department of Commerce. NIST's primary mission is to promote economic growth by working with industry to develop and apply technology, measurements, and standards. Established by Congress as the National Bureau of Standards, it was renamed and assigned new responsibilities in 1988. NIST carries out its mission through a portfolio of four programs: Measurement and Standards laboratories; the Advanced Technology Program; the Manufacturing Extension Partnership Program, and the [Malcolm Baldrige] National Quality Program.

Small Manufacturing Enterprises (SMEs): Companies that employ 500 workers or fewer. In the MEP system, over 50 percent of the SMEs employ 50 employees or fewer.

CHAPTER II: LITERATURE REVIEW

This chapter presents the historical background of training, followed by descriptions of the value of training interventions, especially in the manufacturing industry, that have made positive contributions to the performance of both individual workers and their employing organizations. A discussion follows of high performance work organizations, where training is only one characteristic among many. The chapter concludes with a description and discussion of performance improvement, which corroborates that training is only one aspect of a comprehensive employee improvement initiative.

Historical Background

Training workers to improve their job performance for enhanced productivity has a long history in our country's corporate history. Through the decades, training has been used as a tool for providing workers with specific ways of performing their jobs better, which, in turn, contributes to employers' improved products and profitability. Eurich (1990) observed, "Educational requirements often are the handiest means of ensuring that a person is equipped to continue practicing a profession" (p. 188). As one might expect, training techniques have evolved over the years. In addition, attitudes about the value, necessity and significance of training have evolved as well.

Prior to the rapid industrialization in the mid-19th century, work in this country was learned on-the-job from people who were already performing the job. Native Americans modeled working behaviors from their elders and their peers, and, during the colonial period, on-the-job training was the norm (Nadler, 1979). Learning to do one's job was taught by men (and it was certainly almost all men at that time) experienced in their respective trades. Training programs consisted of workers who instructed younger, unskilled boys, who usually paid a fee for their training. All professions, from artisans to those whom we now call "professionals," employed this mode of teaching novices how to perform a job. Most boys would attend academic schools until a relatively young age, after which they were expected to leave school and learn a trade (Cremin, 1988; Kett, 1994; Stubblefield and Keane, 1994).

Some trades required apprenticeships, which were a form of job training and provided entry into that particular trade (Cremin, 1988). Traditional trades unaffected by industrialization depended on the apprentice system for entry-level workers. At that time, education and job preparation were considered to be separate. Indeed, the notion of going to school to prepare for a specific job or occupation and combining it with traditional education was an idea that would not be created until late in the 18th century (Cremin, 1988; Kett, 1994).

Daily life and supplemental education were not all centered around work. People valued reading, discussion, and other elements of a classic education. Kett (1994) described the popular self-education movement of the early and mid-19th century, when working youth and adults continued to expand their knowledge of culture, as forerunners to some of today's adult

education offerings. These programs were voluntary, conducted in the evenings and during the summers to accommodate work schedules, and many of them stressed integrated learning and living. This form of education was intended to take adult students beyond their everyday working lives. Nevertheless, these educational endeavors were considered to be purely intellectual pursuits, completely separate from training for or performing one's job.

With the advent of technological innovations in the later 19th century, many traditional craft skills became outmoded. They were replaced by jobs that required very specific skills, performed with the assistance of machines. At that point, the concept of training changed, evolving from mostly apprenticeships to a combination of on-the-job, academic and technical training. The R. Hoe Company, which manufactured printing presses, is credited as being the first company to combine academic and technical training in 1872 (Cremin, 1988). The company administered a special night school for their apprentices who worked in the plant during the day. This concept represented a benchmark in the academic/training movement (Cremin, 1988, p. 484). Shortly thereafter, General Electric in Lynn, Massachusetts, the New York Central Railroad, and Brown-Ketcham Iron Works in Indianapolis realized the value of providing additional academic education to their workers' job training, and they established similar programs. A common thread throughout the various company programs was the opportunity for workers to combine their classroom learning experiences with their actual workplace learning, a concept that had been identified as crucial to "...the preparation of competent workers" (Cremin, 1988, p. 484). Miller (1996) summarized businesses' role. "Industry became employer, guardian, and patron of body and soul. Industry was willing to become involved in broad issues of education and quality of life" (p. 7).

Increasing examples of education in the workplace resulted in the formation of the National Association of Corporation Schools in 1913. While the worker-students benefitted from their increased academic and occupational skill levels, the ultimate benefactor of such a system was the employer. More and more, education came to be seen as a critical way to promote efficiency within companies. Indeed, the objectives of the National Association of Corporation Schools included the following statement: "Corporations are realizing more and more the importance of education in the efficient management of their business. The Company school has been sufficiently tried out as a method of increasing efficiency to warrant its continuance as an industrial factor" (Cremin, 1988, p. 487).

During the late 19th century, a mass movement for vocational education for both young people and adults grew in response to the industrialization surge (Cremin, 1988). However, vocational education was not the only impetus for improved worker education and training. During the same period, other movements were occurring, which heightened the efforts to provide education and training to workers. Cremin (1988) identified three pertinent movements of the era that resulted in increased training opportunities for workers:

1) The efficiency movement, as exemplified by Frederick Taylor's scientific management theories and practices, in which workers were trained for and evaluated by their speed and correct execution of their work;

2) Welfarism, in which companies provided their employees with what would now be called "perks" – education being an important offering – primarily to squelch employees' interests in unionism; and

3) Industrial labs, in which corporations focused on applying scientific information to the discovery of new products (Cremin, 1988, pp. 487-489).

Connecting Training with Economic Progress

Vocational education experienced a rise in popularity in the early 20th century and was implemented in public high schools. The Smith-Hughes Act of 1917 provided funding for the implementation of vocational education throughout the public school system. Colleges and universities, meanwhile, were cultivating student bodies that were interested in studying what had become the necessary management aspects of industry. The split between the workers and the managers of those workers was reinforced through their different educational programs. Universities aligned themselves with corporations, educating the so-called "higher level" workers. The vocational and technical high schools, proprietary schools, and correspondence schools, all of which were focused on specific job training, remained responsible for training the lower levels of workers (Cremin, 1988; Kett, 1994; Stubblefield and Keane, 1994).

Some educators were unhappy about the job training orientation of vocational education. John Dewey wanted work to be part of a child's social education, not an end in itself. He and the other Progressives were pitted against the efficiency educators who thought training in the trades for specific jobs was the best purpose for vocational education. The Progressives, who conceived of education as "...an agent for socialization..." (Kett, 1994, p. 314), lost that battle when the fundamental motive behind all vocational training from the late 18th century into the 20th century became job improvement. For the first time, workers and their employers associated vocational instruction as a way to move ahead in jobs. Employees and employers both benefitted by the employees' attaining higher skills. Simultaneously, increased numbers in the professional schools (e.g., law, medicine, engineering) communicated the importance of advanced vocational training throughout the American education system (Cremin, 1988; Kett, 1994).

By the 1920s, the economic argument for continued schooling was the predominant one, leaving behind the Progressives' desire for social education. To Dewey and his Progressive followers, education resulted from productive activity; they considered education to be a mastery of a body of knowledge, rather than a process for adaptation. The Progressives were disturbed to see high school vocational education reduced to industrial arts and guidance, resulting in students being prepared for specific trades. In addition, correspondence schools and proprietary schools

continued to be popular ways for youth and adults to learn a trade and better themselves professionally (Kett, 1994).

This emphasis on education for better jobs and a better quality of life has continued. Since World War II, when techniques for training were used for all workers and not just the academic elites, employers have realized that there are benefits to having trained workers. The Servicemen's Bill of Rights – a.k.a. the GI Bill of Rights – was passed in 1944. The GI Bill "...initiated the great postwar popularization of higher education, especially for men" (Cremin, 1988, p. 250), providing education opportunities for populations who had never benefitted from education before.

Drucker (1993) identified the GI Bill as a seminal education event in the 20th century, drawing new and different students to universities. Indeed, the former service members performed more competently than had been originally anticipated. Their success at their college course work prepared them well for the many jobs that were created in the booming postwar economy (Cremin, 1988). The combination of economic factors and an evolving, successful population in universities caused President Truman to establish a Commission on Higher Education in 1946. "[T]he Commission's report, *Higher Education for American Democracy* (1948), marked a turning point in American conceptions of the higher learning" (Cremin, 1988, p. 251) by enlarging the role for American colleges and universities. The would have to become far more inclusive, i.e., "the means by which every citizen, youth, and adult is enabled and encouraged to carry his education, formal and informal, as far as his native capacities permit" (Cremin, p. 251).

The Effect of Education on Workplace Training

The perceived role for colleges and universities expanded as their student bodies grew in both scope and numbers. According to Cremin (1988), "In effect, the higher education system was being called upon to produce and transmit knowledge at an unprecedented rate, in an unprecedented number of fields, and with a view to civic, national, and even international benefits" (p. 252).

With this change in attitude towards higher education, came a higher perceived value for the benefits of formal education beyond high school. People who continued their education beyond high school found and retained better jobs and, consequently, higher standards of living, than those who did not. This, in turn, benefitted society, providing a sound argument for investing in education. According to Kett (1994):

> Traditionally, education has been perceived as a source of opportunity and a solvent of class differences.... Degreed people found employment suited to their education quickly, therefore it was plausible to argue that the supply of degreed workers was determined by genuine demand for the skills acquired in the process of attaining degrees, and that

> increases in supply as a consequence of personal and public investment in education would facilitate economic growth (p. 436).

The circumstance of abundant jobs began to decline in the 1970s and continued into the 1980s. The current low levels of unemployment have not changed the notion of the importance of education for everyone. The popular press, in addition to labor economists, note that education is a good investment for an individual, because it raises one's incomes above what he/she would have earned had he/she not gone to school. Lester Thurow, the Massachusetts Institute of Technology economist, noted that education is valuable "...not because it would raise people's incomes above what they would have been if no one had increased his education, but because it raises their incomes above what they would have been if others acquire an education and they do not" (Thurow in Kett, 1994, p. 437).

In addition, the more educated the worker, the more likely he/she is to receive additional training from the employer. Zemsky and Oedel (1995) corroborated this notion:

> If there is a single theme that emerges from the diverse efforts of American business, it is a belief in training the trained – investing in skilled employees who already have demonstrated their value to the firm. The workers who are most likely to receive employer-sponsored training are mature, well-educated, proven professional and managerial employees (p. 5)

In some instances, corporate training has stepped in to ensure that employees get the necessary amount of education and training. Some corporations say that the training is for the benefit of the employee; most admit that the corporation benefits when it has an educated and trained employee pool (National Alliance of Business, 1997). Kett (1994) observed that modern corporate training is shadowing its predecessors from the late 19th century. That is, those corporations with the newer technologies are more likely to training their workers than those who are not. Particularly given the high cost of equipment, this category of companies believe they do not have the time to wait around for schools and colleges to catch up with their technical needs.

Firms' Investment in Education and Training

Corporations report that they spend between $55 billion and $60 billion on direct and indirect training, the majority of which is spent on better educated/better trained workers (National Alliance of Business, 1997). Robert Reich, past secretary of the U.S. Department of Labor, noted that companies spend a relatively small amount on front line workers or those who have not completed four years of higher education, compared to the amounts spent by foreign competitors. Reich argued that this reduced amount spent on training is a factor in the United States' struggle to compete with other countries (Koonce, 1996).

The $55 to $60 billion mentioned above reflects a small amount of U.S. corporations involved in training, however. America's choice: High skills or low wages!, a 1990 study by the

Commission on the Skills of the American Workforce, compared America's investment in training to those of foreign competitors that have institutionalized the provision of training to their workers. The U.S. falls short with only a few notable companies, like Motorola, spending two to four percent of earnings on employees. Most other companies have failed to see the benefit of training their employees (Commission on the Skills of the American Workforce, 1990). Theses companies are far more likely to invest in equipment than they are to invest in their workers.

Marshall and Tucker (1992) followed the America's choice study with their book, Thinking for a Living, in which they lobbied for increased investment in education and training, citing it as America's competitive edge.

> There are only two ways to compete–reducing incomes or improving productivity and quality. We can, in other words, become more competitive simply by lowering the price of our goods and services in world markets, either directly or by lowering the value of the dollar in relation to other currencies. That, however, is simply the path to lower income and a diminished standard of living for all Americans – and it is the path we now tread. The challenge is to be competitive while maintaining high incomes and full employment. This is now impossible without high productivity growth rate, and these, in turn, cannot be achieved without very high quality human resources (Marshall and Tucker, 1992, p. xvi).

In The Work of Nations, Reich (1991) emphasized the need for education in order to populate the workforce with "symbolic analysts," the highest level of worker in the current Information Age. This category includes

> "...problem-solving, problem-identifying, and strategic-brokering activities. [These] services can be traded worldwide and thus must compete with foreign providers even in the American market. But they do not enter world commerce as standardized things. Traded instead are the manipulations of symbols – data, words, oral and visual representations" (Reich, 1991, p. 177).

Reich noted that most symbolic analysts are college graduates, but they continue to enhance their skills through on-the-job learning in schools and in the workplace. Reich described workers who have jobs that require them to think and to communicate their thoughts as working whenever those processes are occurring (Reich, 1991).

According to Peter Drucker (1993), the application of knowledge to work is what has transformed our productivity since World War II, allowing people to be far more productive than they had been in the centuries before. Therefore, he reasoned, knowledge has become the resource, replacing the traditional resources of labor, capitol and land. As a result, Ducker called for a new kind of education in which all institutions of employment, including businesses, governments, and non-profit organizations, must become institutions of learning and teaching.

Eurich (1990) supported Drucker's concept in the following statement: "It seems reasonable to infer that a knowledge-based organization must also be a learning based organization in which learning is not confined to company classrooms" (p. 171).

Peter Senge's (1990) concept of the learning organization complements Drucker's model, calling for workplaces that help people to develop the abilities to perceive and then think in systems, rather than in linear events. Schein (1992) placed learning organizations in the context of culture and innovation. Senge (1990) described the role of leadership in an organization as enhancing the capacity of all people to work productively toward common goals. His work articulated a cornerstone position of human values in the workplace; namely that vision, purpose, alignment and systems thinking are essential if organizations are to truly realize their potentials. Senge (1990) concluded, "Given the influence of organizations in today's world, this may be one of the most powerful steps toward helping us to 'rewrite the code,' altering not just what we think but our predominant *ways of thinking*" (p. 367). Schein (1992) emphasized the core value shared by members of a learning organization: "the appropriate way for humans to behave is to be proactive problem solvers and learners" (p. 364). Eurich (1990) identified the need for retraining throughout industries and organizations as critical. She concluded that all levels of workers in all manners of workplaces (public and private) must continue to learn new materials and new skills in their respective jobs.

Managers at some work organizations seem to understand the need for providing training – around workplace skills, academics or systems thinking – for their employees. Approximately 1,200 corporate universities, some offering degrees in connection with local universities and community colleges, currently exist in the United States. The concept of the corporate university varies. At one end of the continuum is Motorola University's offering of a myriad of courses that run the gamut from job-specific training skills to the 19th century definition of purely intellectual pursuits. At the other end of this continuum are companies that refer to their internal training departments as "universities" (Washington Post, September 14, 1997).

While the number of corporate universities and other training opportunities for employees continues to grow, the results are not sufficiently comprehensive to change the concept and implementation of employee education. There remains a gap between the current concept of training and the belief that there should be a new compact between employers and their employees, whereby employees have the responsibility for making their place of employment as productive as possible, and the employers have the responsibility for making their employees as valuable as possible (Marshall and Tucker, 1992; Koonce, 1996).

This new compact between employer and employee benefits both partners. A company's success and the personal and professional success of its workers are inextricably intertwined, creating a particular kind of synergy for the partners and the economy at large. As described in the report, Workforce 2000:

> Education and training are the primary systems by which the human capital of a nation is preserved and increased. The speed and efficiency with which these education systems transmit knowledge governs the rate at which human capital can be developed. Even more than such closely-watched indicators as the rate of investment and plant and equipment, human capital formation plays a direct role in how fast the economy can grow (Johnston and Packer, 1987, p. xxvii).

The Value of Training in Manufacturing Firms

Employee training in manufacturing firms is often proposed as a solution to the frequently-mentioned problem of American manufacturers losing their competitive edge. Sometimes it is offered as the only solution. Constant technical progress in manufacturing industries brings challenges of hiring and retaining a workforce that can work successfully in the presence of those changes. Continual advances in automation have the effect of increasing production. That is the good news. The not-so-good news is the increased demands on workers. Workers in this milieu of continuously improving technology must be able to read and interpret technical instructions, perform calculations quickly, and demonstrate computer literacy. Unfortunately, these demands are being made on a workforce that is less academically prepared in reading and mathematics, is more diverse demographically, and is growing older (Carnevale, 1988; Mikulecky, 1995; Rowden, 1995).

The amount of money that private businesses are spending to address these educational deficiencies is reported to be $55.3 billion – $26.4 billion for direct expenditures (the cost of providing the training, e.g., instructors, materials, logistics) and $28.9 billion for indirect expenditures (the cost of auxiliary services, e.g., incomplete work during the time of the training, salaries for substitute workers, if provided) (Koonce, 1996, p. 27). However, constructing precise estimates on actual annual training expenditures is difficult. If informal training is included, some researchers have estimated the costs to be three or four times that high (Lynch & Black, 1996, p. 2).

How the money is being spent is more revealing. According to former Secretary of Labor, Robert Reich, "A comparatively small amount is invested in training hourly workers on the front lines or workers who have not completed four years of higher education" (Koonce, 1996, p. 27). Fletcher and Alic (1991) reported that "[o]nly 22 percent of U.S. machine operators, assemblers, and inspectors report receiving any skills upgrade training in their current jobs. These figures rise to half or more for professional, technical, and managerial employees" (p. 46). Fletcher and Alic (1991) also noted that "[n]early 50 million U.S. workers need training but will not get it if current trends continue" (p. 46). One can easily conclude that workers who are most in need of training for their jobs – the front line workers – are not receiving it. For most businesses, the investments they have made in physical and equipment capital far exceed the investments they are willing to make in the development of their workers (Carnevale, 1990; Reich, 1995).

Lynch and Black (1996) argued that the research regarding employers' commitment to training, or lack thereof, is inconclusive. They note that existing data fail to provide much specific information on "...types of training..., the relationship between formal schooling and employer-provided training, who is receiving training, the links between investments in physical and human capital, and the impact that human capital investments have on the productivity of establishments" (p. 2). However, the authors also noted some known facts about employer-provided training:

> Employers' investment decisions are also influenced in part by the characteristics of the workers they employ. Employees who are perceived to have higher turnover rates are less likely to receive employer-provided training. At the same time, employees who have already shown an aptitude to learn new skills by having completed more years of schooling may then be more likely to receive additional human capital investments provided by an employer (p. 2).

Lynch and Black (1996) found conflicting information regarding employer investments in training. They reported that some employers invest in physical capital instead of investing in skilled labor, while others perceived human capital investments as complements to physical capital. All employers, including those who invested heavily in training their employees, conceded that investing in human capital carries a cost and should be assessed in terms of the results seen in productivity (p. 2.).

While acknowledging that training is a very important issue, John Bishop (1993), Cornell University economist, described it as very difficult to study.

> Government statistical agencies have only recently begun asking questions about it, and there is, at present, no standardization of data collection procedures across countries. Most training is informal in character and therefore hard to measure. Its effects on productivity are also difficult to quantify. Consequently, there have been almost no studies of the central issue of the impact of employer training on worker productivity. Research has, consequently, focused on issues such as who gets formal training and the impact of formal training (or tenure, interpreted as a proxy for informal training) or tangential outcomes such as wage rates and turnover (Bishop, 1993, p. 1).

Acknowledging the above caveats, the development of a company's human resources is a theme that numerous researchers and practitioners have identified as key to firms' increasing their productivity, while simultaneously narrowing the disparity between workers' skills and firms' present and future needs. Indeed, the research is replete with anecdotal, quantitative, and qualitative studies that demonstrate the benefits of training, i.e., those "[b]usinesses that have made training, education and development a priority are seeing that it pays off through greater profitability and increased worker satisfaction" (Rowden, 1995, p. 356). Wholey (1990) found that formal on-the-job training positively affected job tenure and mobility An emphasis on human resource development affects "...performance, wages, turnover, and worker satisfaction"

(Rowden, 1995, p. 356). Ichniowski and Shaw (1995) studied human resource development practices in the steel industry, noting that "...combinations that emphasize high levels of employee participation in work teams, flexible job design, heavy reliance on incentive pay, and extensive training and communication produce significant productivity advantages over other combinations of more traditional work practices" (p. 53). Mirvis (1997) described a connection between human resources and increased productivity, based on a sample of over 400 Conference Board member companies, 35 percent of which were manufacturing firms (p. 44). Other resources include Arthur, 1994; Bartel, 1991; Bassi, 1995; Carnevale, 1988; Fletcher & Alic, 1991; Huselid, 1995; Jarboe & Yudken, 1997; Osterman, 1994; Pfeffer, 1994, 1998; Ralls, 1994; Upton, 1995; Wagar, 1998; and Wiggenhorn, 1990.

In 1991, Bassi conducted a series of case studies of 72 firms; she followed up with phone and mail surveys in 1992 to identify connections between workplace education programs and reorganization of work (Bassi, 1995, p. 38.) She found that there was a higher level of training occurring in manufacturing firms than in other industries, and that larger firms were more likely to have a workplace education program than were smaller firms. She also found that larger firms were more likely to implement methods of reorganizing than smaller firms (Bassi, 1995, p. 39), noting that "...firms that have undertaken a substantial amount of reorganization are somewhat more forward looking; they are substantially more likely to perceive the skills of their work force as critical to their competitiveness, especially in their ability to compete in international markets" (Bassi, 1995, p. 42). Bassi also found that

> [f]irms that have had an education program in place for more than two years are significantly more likely to report improvements in worker retention and advancement than are firms that have had a program in place for two years or less....Workplace education programs do not cause an increase in turnover. In fact, just the opposite appears to be the case: firms report that workplace education causes a decrease in turnover and an increase in advancement within the firm (Bassi, 1995, p, 45).

Significantly, firms that implement workplace education in tandem with work reorganization get the best results (Bassi, 1990 p. 46). In their study, Johnson, Baldwin and Diverty (1996) found that technology adoption is the most important factor explaining which firms engage in training (p. 117).

The National Center on Educational Quality of the Workforce, located at the University of Pennsylvania, conducted a National Employer Survey (EQW-NES) to identify what determines employers' investments in training. The survey found that the smallest employers are the least likely to provide formal training programs; however, employers who have adapted high performance work organization practices are more likely to offer formal education programs, regardless of their size. In addition, the survey demonstrated that investments in human capital result in "... significant and positive effects on establishment productivity" (Lynch & Black, 1996, p. ii). The study concluded training provided by an employer may "...complement...rather than...substitute for investments in physical and human capital. In addition, there appears to be

evidence of a virtuous circle in human capital investments, whereby employee investments in schooling are augmented by employer investments in training (Lynch & Black, 1996, p. 27), reinforcing the value of training for both employees and employers.

Training in A Large Company

Motorola is often cited as exemplary for its attention to education for its employees. (Commission on the Skills of the American Workplace,1990; Marshall and Tucker, 1992). A winner of the prestigious Malcolm Baldrige National Quality Award the first time it was awarded in 1988, Motorola has a long history of training its employees and evaluating the impact of the training on improving individual and organizational productivity (Siegel and Byrne, 1994, p. 13).

Bill Wiggenhorn, president of Motorola University, wrote about the changes that occurred in manufacturing in the early 1980s that affected profoundly the ways in which Motorola hired and educated its employees.

> ...[A]ll the rules of manufacturing and competition changed, and in our drive to change with them, we found we had to rewrite the rules of corporate training and education. We learned that line workers had to actually understand their work and their equipment, that senior management had to exemplify and reinforce new methods and skills if they were going to stick, that change had to be continuous and participative, and that education – not just instruction – was the only way to make all this occur (Wiggenhorn, 1990, p. 71).

As a result, Motorola began to budget $60 million annually to provide employees with a comprehensive range of skill instruction, all the way from the most basic skills (reading, writing and arithmetic) to "new concepts of work, quality, community, learning, and leadership" (Wiggenhorn, 1990, p. 72). Inherent in the process was a goal of redefining jobs, as well as providing employees with training opportunities (Wiggenhorn, 1990, p. 73), because of their belief that the benefits gained from skill upgrading could not be fully realized without a reorganization of the workplace to which these employees would be returning (Bassi, 1995). Motorola implemented the concept of Six Sigma, which "...translates into 3.4 defects per million opportunities, or production that is 99.99966% defect free....[T]here is always some way to apply the standard and strive for the goal. In effect, the Six Sigma process means changing the way people do things so that nothing can go wrong" (Wiggenhorn, 1990, p. 74). As important, the term, Six Sigma, gave everyone in the company a common language and the common goal of defect free products.

However, before they could implement the Six Sigma concept, Motorola had to be sure their workers could read, write, and perform math at a seventh grade level. Motorola management was appalled to discover that a large portion of their work force lacked that level of skills, meaning that they had to find ways in which they could provide necessary remedial instruction. They adopted a policy that ensured everyone the right to retraining; the policy also

stated that a person could be fired if they refused training. If someone went through training and failed, then Motorola would help them to succeed at other jobs within the company. (Wiggenhorn, 1990, p. 78). The company engaged local community colleges to assist them in formulating remedial curricula, and they developed some of the higher level courses, e.g., engineering courses, in partnership with colleges and universities. This course development led to the development of Motorola University (Wiggenhorn, 1990, p. 79).

Motorola University's goal is to ensure training and education for all of them employees in order "...to prepare them to be Best in Class in the industry; to serve as a catalyst for change and continuous improvement to position the corporation for the future; and to provide added value to Motorola in the marketing and distribution of products throughout the world" (Retrieved from the world wide web: About Motorola University, http://www.mot.com/MU/About MU.html).

Companies that are smaller than Motorola will not be able to spend the time and the money to create a self-supporting education and training institution. However, the "take away message" from the Motorola experience does have universal application. As a result of their experiences with bringing a workforce up to speed in the areas of technical, business and relational skills, senior managers at Motorola

> ...had stopped seeing education as a cost and had begun to accept it as an indispensable investment. They'd seen returns. Most other people in the company had seen more than that. They'd seen themselves picking up marketable skills; they'd felt themselves growing in self-esteem and self confidence (Wiggenhorn, 1990, p. 81).

Motorola's emphasis on training and education for all employees is exemplary, frequently cited as a benchmark for other companies. The company's motivation for continuing to require and provide the high levels of training that they do is reinforced by their continual success in their industry. The company attribute the success to the educational levels of their workers.

Training in Small Companies

Small and medium-sized companies, defined as those with 500 employees or fewer, are significant contributors to the American economy, because they employ nearly half of the total workforce (Eurich, 1990, p. 19). In fact, more than 12 million people are employed by over 380,000 small manufacturers in the United States, constituting over 65 percent of the U.S. manufacturing workforce. Small manufacturers produce over half all that is made by U.S. Manufacturers and account for over $185 billion in payroll (Secretary Daley Declares 1999 as the Year of the Small Manufacturer, February 16, 1999).

Yet, training, specifically, and human resource development, generally, is less prevalent in small firms than it is in large companies (Broadwell, 1996; Deshpande & Golhar, 1994; Eurich, 1990; National Research Council, 1993; Rowden, 1995; Wagar, 1998). This situation is

exacerbated by the circumstance identified by the National Research Council (1993): "Smaller companies need help changing the manner in which they organize work, understanding the importance of upgrading the skills of their employees, and locating the proper means to improve their abilities to function effectively in a rapidly changing environment" (p. 35).

Most small firms are without a dedicated staff person, let alone an entire department, for providing training and development to employees. Broadwell (1996) noted, "These smaller organizations not only have the same kinds of training needs as the larger organizations but they may also have greater requirements because of the diversity of assignments created by their small size" (p. 886). Lynch and Black (1996) also found that

> ...businesses that employ less than 50 workers in manufacturing and less than 100 employees in non-manufacturing are much less likely to provide formal training programs to their workers than are larger establishments. In addition, establishments with a higher capital/labor ration are more likely to provide formal training programs (p. 9).

Some small companies incorporate human resource development strategies into their operations, regardless of their size. Rowden (1995) found that it "...may be very much a part of the management philosophy and be implemented in various ways, including job enrichment, educational assistance, advising/coaching, on-the-job training, and so forth" (p. 357).

In their study of human resource practices in large and small manufacturing firms, Deshpande and Golhar (1994), surveyed the practices of 21 large and 79 small firms in the Midwest. The authors identified nine workforce characteristics, including such flexible work practices as working in groups, worker flexibility, and multi-skilled workers, which were important to both large and small manufacturers. However, small firms indicated these skills were more critical than did their large firm counterparts. Interestingly, the authors observed that neither large nor small manufacturing firms' personnel policies necessarily "...reinforce and nurture the workforce characteristic that they say are important for the success of their firms" (p. 54).

Rowden (1995) conducted a qualitative study of three successful small manufacturing firms to identify the formal and informal HRD activities which they provide to their employees. He was especially interested in establishing links "...between human resource development, management, organizational behavior, and other functions of the organization, and the various measures indicative of a successful business" (Rowden, 1995, p. 358). The companies in his study were in the businesses of manufacturing paint and industrial coatings (87 employees), manufacturing furniture (149 employees), and manufacturing commercial signage (127 employees), respectively (Rowden, 1995).

Rowden (1995) found that none of the three companies actually labeled their employee-supportive activities as "HRD" (human resource development). Nevertheless, evidence showed that each company supported "...the unique market niche of the company through knowledge,

skills, and attitude development, by integrating employees into the company's work practices, and by enhancing the quality of work life" (p. 369). The interviewees defined HRD very narrowly and, therefore, assumed that "...the coaching, mentoring, OJT [on-the-job training], informal learning, and development that they do..." (p. 369) were not forms of HRD.

Rowden (1995) concluded that the success of these three businesses was due, at least in part, to their integrating HRD support into their operations. He emphasized that the process began with selecting and hiring employees who demonstrate appropriate skills, knowledge and abilities, and continues through orientation and initial job training and the ongoing formal and informal training that is provided (Rowden, 1995, p. 370). Marsick and Watkins (1990) described the necessity for helping employees to form "assumptions about how the organization operates" in order to help them to be better contributors to organizational success (p. 29) .

In addition, by using HRD to improve the quality of their employees' work life, the employers in Rowden's study described themselves as feeling secure about their work and believing that they had received adequate education to do their jobs. This, in turn, contributes to low turnover, high morale, and, ultimately, higher productivity (Rowden, 1995, p. 370). Therefore, Rowden concluded, "The role of HRD in the small to mid-sized businesses outlined in this study appear to link HRD to their success (Rowden, 1995, p. 371). His findings corroborate those of Pfeffer (1994, 1998) whose research focused on large companies. Rowden, therefore, reinforced the applicability to small firms of the human resource principles typically ascribed to large companies only.

Rowden's findings echoed the National Research Council's study on small manufacturers which found:

> The benefit of investments in work force education is not always reflected only in upgrading work-related skills....Financial commitment to training and education is often perceived by the employees as evidence that the organization is serious about making the changes and improvements necessary to create a more competitive manufacturing company, and not another 'program of the month' or cost-cutting measure (National Research Council, 1993, p. 36).

Regardless of size, education and training for workers enables them to be more engaged in their job and the company, resulting in higher productivity. Once again, the benefits to both the workers and to the firm are tangible.

Training in the Context of High Performance Work Organizations

As business practices and manufacturing processes have evolved, so have companies' needs for developing the capabilities of their workforces. As discussed above, training has been a consistent vehicle for developing those capabilities. Some of the current management literature, however, specifies that training can no longer be an isolated activity within an

organization. Training offered to employees without any context is often given a poor prognosis for success because it is not linked to or supported by other organizational initiatives (Brinkerhoff & Gill, 1994; Rothwell, 1996). On the other hand, when training is aligned with other strategic initiatives, managed as a process, and placed in the broader context of high performance work organizations, it becomes a significant contributor to the firm's strategic planning and success (Appelbaum & Batt, 1994; Brinkerhoff & Gill, 1994; Commission on Skills of the American Workforce, 1990; Huselid, 1995; Jarboe and Yudken, 1997; Levine, 1995; Mohrman, Cohen, & Mohrman, 1995; Rothwell, 1996).

Limitations of Traditional Training

As described by Brinkerhoff and Gill (1994), the traditional notion of training as a centralized, stand-alone department, with a long list of classes and workshops, is being replaced by a new system of employee training and development, "characterized by a focus on business goals, customer needs, the total organizational system, and continuous improvement" (p. xi). This transition of thinking about training results from a realization that the aforementioned "long list of classes and workshops" represents a frequently large and unaccountable investment of company resources, the results of which are often lost on the participants because they cannot see the connection to their own work. Broad and Newstrom (1992) reported that the majority of money employers pour into training is wasted because employees do not use the training when they return to their jobs. Baldwin and Ford (1988) found that approximately 40 percent of a training program's content was transferred to the workplace.

Brinkerhoff and Gill (1994) identified an additional misperception about traditional training. In that context, training is perceived as

> ...the locus of learning and change. The very terminology of instructional systems design is founded on a belief that discrete training programs can somehow, if they are only more effectively managed, bring about the change that organizations are desperately seeking...perpetuat[ing] the view that training programs are the point of leverage for bringing about learning and change in employees (Brinkerhoff & Gill, 1994, p. xiv).

According to Rothwell (1996), traditional approaches to training result in problems in the four following categories:

1) *Training often lacks focus*. The term "training" conjures up a range of names and concepts, from education and development to human performance terminology, all of which connote a wide range of roles and responsibilities. By limiting the function to the term "training," one minimizes the value and extent of impact training and development professionals play in enhancing human performance in their organizations (p. 6).

2) *Training often lacks management support*. The value of human contributions to organizational productivity is not always obvious to managers, whose perceptions of organizational systems are limited to more tangible areas, such as finances, marketing and production (pp. 7-8).

3) *Training is not always planned and conducted systematically in ways consistent with what have long been known to be effective approaches to training design.* Training can solve problems attributable to an individual's lack of knowledge, skill, or attitude; however, training will not solve the problems of poor management practices. The application of training to inappropriate circumstances is often exacerbated by the people with training responsibilities within an organization. Often, the responsibility for training is given to someone who has been promoted from within, who does not have the necessary knowledge or skills of when or how to conduct training (pp. 9-10).

4) *Training is not effectively linked to other organizational initiatives*. When training is presented in an isolated fashion, the participants are unable to see the connection with other organizational initiatives, such as the firm's mission and strategy, incentives, or strategies. The training receives little or no support when the participants return to their jobs, resulting in little change in their behavior after the training is completed (p. 11).

The Role of Training in High Performance Work Organizations

As stated in Chapter 1, training is a very important component of high performance work organizations, but it is not an end goal. Rather, training is characterized as a means to an end – the end being productive, efficient work organizations, populated by informed workers who see themselves as significant stakeholders in their firms' success. The short hand description for such a workplace is "high performance work organizations." Jarboe and Yudken (1997) described high performance work organizations as "... combin[ing] innovative work and management practices with reorganized work flows, advanced information systems, and new technologies [based on] the skills and abilities of frontline workers to achieve gains in speed, flexibility, productivity, and customer satisfaction" (p. 65). Rothwell's (1996) description of high performance organizations is characterized by "...flexibility, organizational practices that support prompt decision making, and few layers of command....[E]mployees are empowered to meet or exceed customer needs and are supplied with the right resources at precisely the right times to perform optimally" (p. 13).

The skills required by employees to work effectively in high performance work organizations may certainly require training. In fact, they usually do. The difference is that in high performance organizations, the focus is on the output of training, not on the training itself. As a result, the various definitions of high performance contain many more elements than training, for example direct participation in determining work processes, representative participation with management, pay for skill or pay for work, sharing information, and

management support (Levine, 1995, pp. 178-179). According to Huselid (1995), a high performance firm's strategy development and deployment include human resource development as a means for bringing about high performance. Broad and Newstrom (1992) reiterated the need for connecting training to the firm's strategic planning initiatives (p. ix).

In their study of high performance work organizations for the American Society for Training and Development (ASTD), Gephart and Van Buren (1996) found that definitions of high performance vary as they are used in practice by different companies. However, the authors identified some common themes:

1) Companies organize work-flow around key business processes and often create teams to carry out those processes.

2) People are considered to be a critical competitive asset. As a result, human resource polices and practices – for example, hiring, training, performance management, compensation – enhance employee skills, knowledge motivation, and flexibility.

3) Management must practice new approaches, e.g., coaching, facilitating, and sharing responsibility with employees. Leadership demonstrates a clear vision for the future, accompanied by a well-defined strategy for effecting the vision.

4) The organization performs as a system, with each element of the system providing support for the rest of the organization. For example, communication and information systems, technical systems, and measurement systems all complement the human resource system (p. 22).

Gephart and Van Buren (1996) also found that not all high performance companies demonstrate all of the above components. They observed, "Exactly which combinations work best, and under what conditions, needs further exploration" (p. 23). They also explained that synergy occurs from an organization able to produce two outcomes: "First, all of its parts are aligned and fit together. Second, people in the company are deeply committed, energized and impassioned about their work" (p. 23).

In their study, Gephart and Van Buren (1996) listed factors that practitioners identified as critical to the success of high performance work systems. These factors are listed below in the authors' order:

- a compelling case for change linked to the company's business strategy
- change owned by senior and line managers
- sufficient resources and support for the change effort
- early and broad communication
- teams implemented in a system context
- adequate capability and training

- capacity for measuring the results of change
- continuity of key leaders and champions (p. 28).

The literature does not denigrate the need for training. The difference is the context in which training is placed. For example, Gephart and Van Buren (1996) described Corning Incorporated's reopening of their Blacksburg, Virginia plant. The company committed itself to high performance for this operation. To reach that goal, they flattened the management structure, management worked closely with the union to create new personnel policies, and they designed selection and hiring procedures that measured applicants' skills in problem-solving and conflict-resolution. The company also wanted their new workers to be able to work in teams and to agree to support the company's mission and focus on customer service (Gephart and Van Buren, 1996, p. 31).

The Corning case study emphasized the company's high premium on training in the process of reopening the Blacksburg plant. Gephart and Van Buren (1996) reported, "During the first year, workers spent more than 30 percent of all on-the-job hours in training. In subsequent years, training leveled off to 5 to 6 percent of time on the job" (p. 31). However, it is important to note that the outcomes of the training were the significant elements, not the training itself.

> The 200 workers in the Blacksburg plant are divided into 15-member teams that schedule their own work, performance statistical analyses, and manage quality. Team members are called operations associates. Teams review problems, schedules, goals, and performance in two 15-minute, shift-exchange meetings, one at the beginning of the shift and one at the end....There are only three levels of workers in the entire plant, from operations associates, to leaders, to the plant manager. Coordinating roles, such as scheduling, production, site and safety, and training, are performed by team members who take on responsibilities typically performed by a supervisor (p. 31).

Examples of companies that are practicing the principles of high performance are easily found, but they do not yet constitute the majority of American firms (Appelbaum & Batt, 1994; Lawler, Mohrman, & Ledford, 1995; Levine, 1995). Especially in manufacturing, obstacles to systemic change towards high performance occur in the forms of the historic institutional frameworks within which most firms operate. The "old ways" were initially established to support a mass production system, rather than the flexible and lean systems that are required today. This mass production system caused price to be the basis of competition. According to Appelbaum & Batt (1994), "Now that the basis of competitive advantage in the advanced industrial economies has changed, U.S. economic development is constrained by the very institutions that previously assured its competitive success" (p. 147).

In addition, Appelbaum & Batt (1994) identified financial systems and labor market institutions as two more obstacles that challenge firms as they attempt to move to high performance. Financial systems are perceived as a barrier because they affect ways in which firms can "...invest in new technology and in such intangibles as work reorganization and

training" (p. 147). Labor market institutions are also a barrier because they "govern skill acquisition and the terms on which labor can be hired" (p. 147). These conditions are exacerbated by incentive systems that reward managers for focusing efforts on short term profits because of stakeholders' demands. According to Appelbaum & Batt (1994):

> The erosion of the concept of 'ownership' of publicly held corporations and the rise of the market for corporate control have made the maximization of the current stock price the chief goal of publicly held firms in the United States. This has impaired the ability of these firms to make financial commitments to other stakeholders or to make investments that pay off over the long run (p. 147).

Nevertheless, there are indications that changes are occurring in American firms and institutions. Market demands for flexibility and quality have contradicted scientific management strategies, with their strict routinization of procedures, resulting in movement towards the characteristics of high performance (Levine, 1995). One characteristic to which Appelbaum & Batt (1994) attributed the change towards high performance is a far broader constituency for support than the concept had garnered in the past. It now includes employers, employees and their unions, and local, state and federal agencies. As a result, these authors concluded:

> The question is no longer whether change in work organization will occur, but what changes will occur and who among the various stakeholders will benefit most. The answer depends on who the critical actors are in the process of organizational change and what their relative balance of power is (Appelbaum and Batt, 1994, p. 6).

Appelbaum and Batt (1994) also observed that, since a growing number of companies have made the move to high performance, there is guarded optimism that the system has applicability to American companies. The authors were cautious in their predictions for success, however, because of the small numbers of companies that are putting high performance practices into effect (p. 8). They also pointed out that American firms have put their own "spin" on the principles of high performance, some of which has been learned from European and Asian companies. American companies have melded the principles of high performance with American practices, "including applications of the principles of organizational psychology and American experiences with collective bargaining" (p. 7).

The workplace strategies that are now requisite to manufacturing success are manifested by changes in the workforce, too. These new conditions are requiring a new kind of worker to be functioning in a new kind of workplace, one that emphasizes training, involvement, and autonomy (Appelbaum & Batt, 1994; Levine, 1995). Manufacturing Extension Partnership Program staff at the National Institute of Standards and Technology concluded the following about high performance workplaces in manufacturing industries:

> Where once the emphasis was on simplifying tasks to the point where even the least trained person could perform them, today there is greater emphasis on training and

> education to provide workers with the capabilities to deal with continuous change. Where once the emphasis was on centralized decision making, the new aim of job design and work organization is to enable employees to exercise more discretion and decision making, leading to greater flexibility and more rapid response to the changing requirements of the marketplace (Byrne, Fowler, Troppe and Yudken, 1997).

Training of these new workers – from management to line worker – is critically important, with the caveat that the training will be perceived and conducted as one element in a firm's larger system. As described by Vander Linde, Horney, and Koonce (1997), "...in high performance organizations, training is viewed as a function that operates laterally across the company and that plays an integrative and even transformational role" (p. 22).

Training as a Component of Performance Improvement

A combination of pressures on companies in the form of globalization, increasing demands for higher quality products and services, ever increasing financial returns, and increasing employee demands is require the redefining of human resource professionals' responsibilities. A shift is occurring from design and implementation of training as a major focus to training for improved output. In other words, training and development is shifting toward performance improvement, which has been defined as the continually improving performance of individuals and organizations (ASTD, 1996).

Marc Rosenberg (1996), from AT&T, described the relationship between training and performance improvement:

> There is no doubt that training plays a key role in the development of high-performance workers and corresponding increases in productivity. But we have recently become keenly aware that not only is training expensive, it may not always be the best way to achieve performance goals. And we have also learned that training alone certainly is not as effective as when it is combined with other performance-enhancing strategies....While we build and manage training facilities and begin to deliver learning using alternative technologies we also need to link our work into a comprehensive process that leverages a much wider array of performance improvement interventions (p. 372).

To describe the implementation of performance improvement, Vander Linde, Horney, and Koonce (1997) cited a case of an auto manufacturing firm. A training manager at the firm explained that training staff conduct needs analyses to identify potential solutions to business problems, and the solutions may or may not require training. The training manager was quoted as saying, "Training isn't always the only answer to performance issues here. Sometimes it's not even the preferred way. We might suggest job aids, self paced learning, or a job redesign" (p. 25).

In the implementation of performance improvement, training may be introduced to improve a worker's performance; however, it is seen as only one way to improve that worker's

performance. For example, Dean, Dean and Rebalsky (1992) identified factors in the workplace environment that could be changed; the result was a positive effect on performance that occurred more quickly and less expensively than by training the employees to make a specific change (p. 75). A shift to performance improvement, also called "human performance technology" (Rosenberg, 1996) and "performance technology" (American Society for Training and Development, 1995), "...helps link business strategy and goals, and the capability of the workforce to achieve them, with a wide array of human resource interventions which include but are certainly not limited to education and training" (Rosenberg, 1996, p. 370). Performance improvement applies systems thinking to human resource activities (ASTD, 1995; Rosenberg, 1996; Rothwell, 1995).

Performance improvement goes beyond training by not only focusing on the analysis of job-related performance, but also by identifying the underlying causes of the performance in question. The result is the selection of solutions that will best improve employee performance in the context of overall organizational performance (Rosenberg, 1996, p. 371). Therefore, performance improvement requires training professionals to focus on how participants' performance is improved following training in terms of alignment with their companies' goals, not just how they responded to the training itself. Implicit is the need to contribute to the company's specific business goals (ASTD, 1992; ASTD, 1996; Rosenberg, 1996; Rossett, 1996; Rothwell, 1995, 1996). The American Society for Training and Development (ASTD) described performance improvement: "The behaviors and on-the-job processes–from the simplest task to the most complex corporate strategy–are examined for high returns" (ASTD, 1992, p. 1).

According to Rothwell (1996), who used the term "human performance technology (HPT)" in his writing on the topic:

> HPT recognizes that human performance is influenced by many factors working separately and collectively. Performance is not solely the result of individual efforts to apply knowledge to work, which is the traditional – and often exclusive – focus of employee training efforts. By the same token, training is no longer enough to help individuals and their organizations meet present challenges. Something more is needed. While training is no less important than it once was, it is not the only way to improve human performance (Rothwell, 1995, Online).

In a publication for the American Society for Training and Development (ASTD), Bricker (1992), using the term "Performance Technology (PT)," also placed great emphasis on the importance of the organization within which the performance takes place and recommends a holistic approach in assessing and recommending ways to intervene. Typically, trainers and HR people assess learning needs, design, develop and deliver training, and evaluate results. While all of these activities are associated with effective training courses, the concept of performance improvement goes beyond the traditional activities that often depend upon training to be the only way to solve the problem and assume individuals' responsibility to learning something new to fix a problem (Bricker, 1992, p. 1).

Three key assumptions of Human Performance Technology emphasize the multiplicity of causes involved in what is perceived to be a problem in an employee's performance:

> 1) the importance of the work environment in enabling employees to become effective;
> 2) the multi-factored causes of performance problems that defy training as the sole solution; and
> 3) the multi-factored results that occur when changes are introduced in one area, i.e., changes in one area will affect other areas.

The processes involved in Performance Technology are not unlike those involved in the traditional training activity: defining the problem, analyzing the problem; designing and developing solutions to the problem; implementing and maintaining solutions to the problem; and evaluating the intervention. The difference is the scope of these steps. For example, analysis should occur at the organizational, work flow or process, and individual job/performer. The performance technologist, then, is looking for anything in the inputs, processes, or outputs, that may be preventing or enhancing the desired performance (ASTD, 1992, p. 5). The findings are not limited to training. According to the ASTD report on Performance Technology, "Some of these may be related to work redesign or require a human factors engineer or ergonomics expert. The problem may be related to incentives and require a compensation expert" (ASTD, 1992, p. 5). The training professional probably does not have expertise in all of these areas; therefore, he/she can function as a broker who recommends specialists, manages the teams, and serves as a general project manager, as well as designing any training solutions that may be appropriate.

The challenge to the training professional is to identify the multitude of contributing factors and then link any training interventions to the company's performance goals. As described by Rosenberg (1996), "Intervention selection is based on a complete analysis of the situation, and a *wide array* of interventions is considered" (p. 384).

The effect of performance improvement on the HR professional is profound. Vander Linde, Horney, & Koonce (1997) wrote that training in high performance organizations is

> ...emerging to play a critical, integrative role as a driver of cultural change, process alignment, job redesign, and continuous improvement. In a very real sense, it is serving as a change engine to help generate an organization's resilience and core competencies. Those are the success traits an organization needs to compete effectively in a constantly changing, often-turbulent business environment (p. 28).

The shift from training as a stand alone activity to performance improvement is a reflection of organizations' needs to improve their productivity and their competitiveness. The transition is described by Rosenberg (1996, p. 389) as follows:

Five Major Transitions that Will Effect Training and HRD

From	To
Learning as an end in itself	Valued performance as the primary measure of effectiveness
Training and other interventions as tactical responses to somewhat larger problems	Performance technology as a strategic response to strategic needs relating to people and productivity
A view of training as overhead and support, susceptible to budget cutting and downsizing	Performance technology as a competitive resource, perhaps even more important during business downturns
Interventions placed in HR functional chimneys that do not communicate with one another	An integrated performance improvement system that is *systemic* throughout the organization
A focus on education results, e.g., learning	A focus on organizational and business results, e.g., the bottom line

High quality earning will continue to be important in the workplace; therefore, training and education will always be important. However, as competitiveness and productivity grow in significance, employees will need to prove that they are applying that learning, which will result in increased competitiveness and productivity for their companies.

Conclusion

Training has been identified as a significant component of companies' success. This literature review identified American companies' investments in training as originating with apprenticeship programs in the 18th century. In manufacturing industries, it is especially important that the workforce is as up-to-date as possible on all technical aspects of the job. Companies managed with the belief and practices that demonstrate workers' knowledge, skills, abilities and other characteristics are critical assets for ensuring success have shown increased productivity, lower employee turnover, and higher employee satisfaction. While the concept of training as a stand alone entity is evolving and is identified as only one component of performance improvement by many practitioners in the human resources field, the emphasis on developing individual workers is still the dominant theme.

The question remains: how can companies expect to be competitive when their workers do not have the requisite skills to ensure their individual and their company's continuous improvement? And as it pertain to this study, how can technical assistance providers who purport to improve the outcomes of their client firms neglect such a critical component of a

firm's success, i.e., ensuring workers have opportunities for learning interventions? Providing holistic services requires that the provider of those services consider the interdependence of all systems, including workforce systems. This study investigated why some MEP center include this key element in their provision of services to their clients and why others omit it.

CHAPTER III: METHOD OF RESEARCH

The primary question posed in this dissertation is why some Manufacturing Extension Partnership (MEP) centers include training and other flexible work practices as components of their technical assistance services to their client firms, while others do not. Implicit in the question is the issue of whether or not training, flexible work practices, and other aspects of human resource development are valued as vital elements of a company's operations. This chapter describes the study design, the cases, the procedures for data collection and storage, and the method for analyzing the data which I utilized in order to answer the research question and to identify the enablers and barriers inherent in MEP centers' policies, events and attitudes that encourage or discourage them from providing these services.

Design of the Study

Because of the emphasis on the "why" of the issue, I selected the qualitative case study approach as the most appropriate means for conducting this study. According to Stake (1995), a case study goes beyond "yes" and "no" answers to elicit "...[descriptions] of an episode, a linkage, an explanation" (p. 65). Yin (1994) recommended the selection of a case study when the questions asked by the researcher are "how" and "why" in nature and "...when the investigator has little control over events, and when the focus is on a contemporary phenomenon within some real life context" (p. 1). Merriam and Simpson (1995) differentiated case studies from other forms of research based on their focus on multiple variables in a single unit, rather than a few variables across numerous units, thereby discovering "... the interplay of significant factors that is characteristic of the phenomenon" (p. 108). Finally, Merriam (1988) indicated that qualitative research is selected when "...insight, discovery and interpretation" are more appropriate to the researcher's study than the testing of hypotheses (p. 10).

In addition, Merriam (1988) identified characteristics of qualitative research that are pertinent to this study. She defined the naturalistic paradigm as placing meaning in a naturally occurring context (p. 3), and a particularistic study as one that focuses on a particular situation, event, program or phenomenon (p. 11). Finally, she identified interpretative studies as using data to "analyze, interpret, or theorize about the phenomenon" (p. 35). Bogdan and Biklen (1992) used similar terminology to describe observational case studies, i.e., focusing on one organization or a part of that organization. They identified major data gathering techniques as "participant observation" (p. 63).

The parameters for qualitative research presented above are applicable to this study. Per Yin (1994), I, as researcher, had no control over the events I observed. Furthermore, the focus of this study is "...a contemporary phenomenon within some real life context" (p. 1). As explained by Merriam and Simpson (1995), multiple variables exist in a single unit, i.e., the perceptions and experiences of several stakeholders who represent management, administration, and operations of the MEP centers being studied. And, most applicable, I am not testing a

hypothesis. Rather, the value of "...insight, discovery and interpretation (Merriam, 1988, p. 10) will be the most significant contributors to this study.

With the above descriptions of particularistic qualitative case studies in mind, I applied interpretative qualitative research methods, based on the naturalistic paradigm, in order to understand the issues raised in this study. I conducted grounded theory research by completing case studies on three Manufacturing Extension Partnership (MEP) centers, following the principles proposed by Strauss and Corbin (1990, 1998). The interviewees from the three MEP centers responded to questions and engaged in discussions about their backgrounds and experiences, their centers' operations and policies, and their consulting practices. These data, in turn, became the means to sample events and incidents that emerged as a body of information. Ultimately, I used that information to identify categories, concepts, and contexts to create a model that describes the developmental phases of transitioning to a high performance organization.

The Cases

The purpose of my research was to identify a continuum of enabling and inhibiting behaviors exhibited by technical service providers who offer consulting services to small manufacturing clients. My particular interest in the systemic nature of an organization suggested to me that a portfolio of comprehensive services would necessarily include an investment in people systems, i.e., human resource development, training, and other flexible work practices, as well as manufacturing and other technical systems.

Context

The Manufacturing Extension Partnership (MEP) program is a nationwide network of 78 not-for-profit centers, employing more than 2,000 staff who work with small and medium-size companies in their respective local areas. The mission of the centers is to strengthen the global competitiveness of smaller U.S.-based manufacturing firms by assisting in the adoption of advanced technologies, techniques and business practices. Centers provide local access to information, decision support, and implementation assistance for client firms in adopting new, more advanced manufacturing technologies, techniques, and business practices. The MEP centers work to provide their local small and medium-sized manufacturers with the help they need to succeed.

The Centers, located in all 50 states and Puerto Rico, are linked together through the National Institute of Standards and Technology, a non-regulatory agency of the U.S. Department of Commerce. A focus on inter-center cooperation makes it possible for small manufacturing firms to have access to the MEP network of manufacturing and business specialists across the country. Centers provide technical assistance and consulting services to all manufacturing industries. More than half of their clients are companies who employ 50 or fewer workers. When the MEP program began in 1988, the emphasis was on technology transfer. Over the program's ten years of existence, this emphasis has begun to short to a broader array of services

that include people systems, i.e., training and other flexible work practices. This expanded vision is moving slowly through the system; its adaptation is meeting with varying degrees of implementation.

Selection of Centers

I selected three of the system's 78 centers for this study. The three centers represent a range of geographics (rural to urban), staff sizes (from 16 to120 employees, including manufacturing engineers, operations staff, and administrative staff), and longevity in the MEP system (from two and a half years to nine years).

From the beginning of my research, I intended the center selection and study process to be iterative. That is, I planned to conduct a comprehensive study of one MEP center, chosen because it reported few, if any, client engagements in the Human Resource category (defined as training and other workforce-related activities) on the NIST Activity Data Logs (ADLs)[3]. I intended subsequent choices to be based on identifying MEP centers with potential data for corroborating the findings from the previous center(s), demonstrating the practice of theoretical sampling (Strauss and Corbin, 1990, 1998).

I selected the first center, Center One, because it consistently reports zero Human Resource Activities on its ADLs. However, the data provided by the five Center One stakeholders indicated that not only did they have some positive views about training and other flexible work practices, they occasionally included these activities as components of their service delivery to client firms. They do not report these human resource-related activities on their ADLs because their state charter requires them to serve as a broker of services. In the case of training, they refer all activities, per se, to partners from public post-secondary educational institutions or, occasionally, to private consultants and exclude them from their ADLs. This circumstance led to the realization that the ADLs are not a reliable source for identifying MEP centers' values regarding training and other flexible work practices.

The data from Center One provided a wide range of attitudes, values, and practices with regard to training and other flexible work practices. Indeed, the data represented extreme categorical dimensions and led to the tentative formation of four constructs. The data from Center One demonstrated that its performance, values, and attitudes reflect an early, less developed focus on high performance.

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[3]ADLs are comprised of data collected from MEP centers and submitted to NIST quarterly. These data categorize the kinds of technical assistance activities that the MEP centers provide their client firms, e.g., quality inspection, business systems/business management, human resources, market development, environmental, financial, or plant layout. Currently, NIST MEP collects data on 15 categories of activities. Human Resources accounts for approximately 10% of reported activities.

Per the principles of grounded theory, my choices for additional centers for study provided data that would add, modify, confirm, extend, or negate the emerging descriptions from Center One's interviews. Therefore, I selected Center Two for study because data from its NIST evaluations, including its Center Reviews, its ADLs, and discussions with the NIST Regional Manager who has oversight responsibility for the Center, all indicated that this Center was making the transition towards high performance. Center Two applies those practices within its own operations, and it is assisting its client firms to implement high performance practices, as well. Center Two, therefore, allowed the exploration of the application of the constructs identified in the Center One study to a center that was further along on the developmental model that demonstrates the transition to high performance.

Center Three, which is the largest of the three centers and has the longest tenure of the three in the MEP system, also reports training and other flexible work practices in its reporting data to NIST. Comparing their data over the years, conducting preliminary discussions with the center's director of human resources, and holding discussions with the NIST Regional Manager indicated that Center Three was making the transition to high performance also. Center Three enabled an exploration of the ways in which an established center modified its policies, practices, and values to reflect a new way of doing business, i.e., operating under the rubric of high performance, both internally – with its center staff – and externally – with its client firms. Center Three, therefore, provided another perspective on why MEP centers do or do not include training and other flexible work practices in their services to their client firms.

Selection of Interviewees

In order to meet my objective of making Center One the most comprehensive of the case studies, I interviewed the center director, two field engineers, an executive from a small manufacturing firm who is also a Center One board member, and the NIST Regional Manager who has federal oversight responsibility for the Center. They provided a wide variety of views on the value of training and other flexible work practices in small firm environments.

Per the principles of grounded theory, my choices for additional centers for study provided data that might add, modify, confirm, extend, or negate the emerging descriptions from Center One's interviews. At Center Two, I interviewed two people: the center director and a field engineer. The center director was hired two years ago and charged with helping Center Two become more of a full-service consulting organization. The field engineer, who was educated and certified as a teacher and who also had manufacturing experience, is responsible for the center's workforce agenda. She also provides training and workforce-related assistance to client firms.

Finally, I interviewed the Manager of Human Resources at Center Three. Since 1996, his role at Center Three has been to organize all center-wide training and development activities for the center's field staff. He has been instrumental in helping the Center Three field staff make the transition towards high performance.

Process and Schedule

I conducted the interviews over a six-month period, from August 1998 to February 1999. I interviewed the subjects in person or on the telephone. The interviews were unstructured, meaning that I did not use a pre-determined script. I interviewed both the Center Director and the Sales Director from Center One twice. I had follow-up, informal conversations with the Center Two and Center Three interviewees three times. I interviewed all of the other participants once. The interviews lasted from 45 minutes to 90 minutes. In addition, I had several informal conversations with directors and field staff from other centers and the NIST regional managers. I documented and transcribed these discussions as memoranda

All of the participants willingly allowed me to tape their interviews. I transcribed all of the interviews and coded them, per methods of grounded theory described by Strauss and Corbin (1990, 1998). I used the same coding methods for the memos of the informal conversations. The coding was done using Ethnograph, Version 5.02 software.

Threats to Credibility

As I am an employee of the federal agency that provides some of the funding as well as oversight to the MEP centers, I was concerned that the subjects would feel uncomfortable about sharing their experiences and their beliefs. However, I did not sense any such difficulties. Assurances of anonymity were accepted, but did not appear to be of concern. Indeed, all of the interviewees were open, honest, and willing to participate in the study. I mailed each of them their respective center's case study from Chapter Four for their review, including the introduction to the chapter and the definitions of the constructs. They provided written or oral comments and edits on a timely basis, clarifying information that they judged to be either ambiguous or incorrect.

All of the interviewees expressed interest in the study. At the end of the interviews, they mentioned the value of the study for the MEP system. I completed the interviews feeling as though all of the interviewees were true partners in this research endeavor, as evidenced by the amount of time they willingly spent with me in the interviews. All of the interviews exceeded the original reserved time. With each interviewee, I offered to stop at the designated time. However, each person assured me that he/she would like to continue our conversation. Indeed, it was the interviewee who continued our discussions by launching into a new topic.

Data Coding and Analysis

Morse (1994) stated, "If the question concerns an experience and the phenomenon in question is a process, the method of choice for addressing the questions is grounded theory" (p. 223). Grounded theory research, according to Strauss and Corbin (1990), directs the researcher to continue the process of theoretical sampling until he/she is unable to discover new relevant categories, the category development is dense, and the relationships between categories are well established and validated (p. 23). The authors also explained that the researcher's role is to capture "...as much of the complexity and movement in the real world that is possible" (p. 111).

In order to accomplish that, Strauss and Corbin (1990, 1998) suggest the researcher follow a series of systematic procedures to arrive at his/her grounded theory:

> (1) open coding – descriptors of the interviewees' attitudes, experiences, and values with regard to human resource development in organizations, in general, and to training and other flexible work practices, specifically;
>
> (2) axial coding – identification of the connections between the categories that emerge from the open coding process, resulting in patterns that reveal relationships between properties and dimensions of categories; and
>
> (3) selective coding – development of the central phenomenon in the study which emerges from systematically relating core categories to other categories.

As a result of this process, the grounded theory researcher can identify and describe "the main analytic story line" that has been discovered through the course of the study (Straus and Corbin, 1990, p. 144).

Coding is critical to the grounded theory method of data analysis. According to Strauss and Corbin (1990, 1998), "Coding represents the operations by which data are broken down, conceptualized, and put back together in new ways. It is the central process by which theories are built from data" (p. 57), The data are coded and analyzed continuously as it is being collected, enabling the researcher to apply logical deductive methods to verify theory. The commercial software package, Ethnograph, permits data coding, analysis and storage. I used Ethnograph, Version 5.02, to analyze the data.

I attempted to follow the recommended order by conducting continuing questioning and analysis of the selected interviewees with the intent of discovering the relationships and interconnectedness among the concepts. The interviews resulted in 80 open codes, from which I was able to identify axial codes and patterns in the interviewees' responses. However, the process became non-linear very quickly as the various interviewees responded to the questions. The result was a quick trip through the various "steps," sometimes skipping a step, looping back

to prior steps, and a story line that suggested a developmental model that emerged before I completed the first center's case study. I applied the constant comparative method of qualitative analysis throughout all of the interviews.

Data Storage

I utilized interviews and archival data as the primary sources of data. As mentioned above, I stored the interview data using the commercial software package, Ethnograph, version 5.02, to code the raw data, respecting the confidentiality of the MEP centers, their staff, and other participants selected for this study. I tape recorded and transcribed each interview; therefore, I was the only person who listened to the tapes. Analysis of the interviews was based on the information in the transcripts. Once they were transcribed, the original tapes were placed under lock and key in my residence. I am the only person with access to the tapes.

I will keep the tapes beyond completion of the dissertation for purposes of verification and in the event there is a need to continue or expand the research. Once that has been accomplished, I will erase the tapes. In the write-ups, all identifying information, i.e., names of the interviewees, the MEP center, locations of work or organizations, and events, were excised from the document.

Interview Questions

I conducted semi-structured and unstructured interviews with the aforementioned subjects, i.e., key representatives from the selected centers and appropriate NIST MEP staff, e.g., Regional Managers and People Systems team members, to ensure there is ample opportunity to gain clarification and additional knowledge from the interviewees' responses (Merriam, 1988). The interview question were directed toward the primary research question: what are the enablers and barriers that influence the selected centers' decisions to offer or not to offer training and other flexible work practices as part of their service delivery to client firms?

The following represents the topics and issues discussed with each interviewee:

- the background and history of the center;
- the center's original authorization/charter and how the center makes decisions in that context;
- the formal and informal relationships with other organizations, including institutions of higher education;
- the structure of the center's management system;
- the interviewee's educational and professional background;
- the interviewee's definitions of and experiences with training and other flexible work practices;
- the center's customer requirements.

The data provided by the interviewees, in conjunction with discussions with NIST staff and supporting NIST documentation, enabled me to apply the grounded theory processes of open and axial coding and theoretical sampling. In that process, I discovered the relationships and interconnectedness of core categories which I related systematically to other categories. Strauss and Corbin (1990, 1998) identify this as the integrating phase of the research, which leads to theory development.

Form of the Final Dissertation

The three MEP centers provided data for three individual case studies which are presented in Chapter Four. The case studies demonstrate the differing ways in which each of the centers behave with respect to the four constructs that emerged from the data. A summary at the conclusion of Chapter Four demonstrates the interconnectivity of the four constructs as exemplified by the three centers.

In addition, the data gathered from the centers' stakeholders' interviews, combined with the formal and informal interviews with NIST staff, provided an intervention strategy to help centers, the units of analysis in this study, and their respective staff members, make the transition from traditional management practices to an environment more characterized by the principles of high performance. Chapter Five describes that model.

Data from the case studies informed the intervention model. Together, they can inform the decision process of technical assistance providers who want to provide holistic services, including training and other flexible work practices, to their small firm clients. This is pertinent to NIST and its national system of technical assistance providers. Other small consulting companies or other publicly funded technical assistance providers can benefit from the findings of this study, as well.

My assumption throughout the study is that the more holistic the services provided by the MEP centers, the more beneficial to the client firm. This premise has broad implications for services provided to a wide range of industries, since more than manufacturing companies must demonstrate concern with the ways in which their workers are prepared to meet the continually evolving changes in their workplace.

CHAPTER IV: CASE SUMMARIES

Introduction to the Case Summaries

My research identified a continuum of behaviors exhibited by technical service providers who offer consulting services to small manufacturing clients. The service providers are participants in the National Institute of Standards and Technology Manufacturing Extension Partnership (NIST MEP) program, in a national network of not-for-profit centers that help small and medium-sized manufacturers with technical and other business concerns. I interviewed stakeholders from three of the MEP centers.

I began this study with a judgement about the necessity of providing holistic services to client firms, i.e., emphasizing the systemic nature of the organization which necessitates investing in people systems as well as manufacturing and other technical systems. Therefore, I was especially interested in understanding why some of these technical service providers would decide to offer services that include training and other flexible work practices, thereby expanding an approach limited to technically-oriented services only. Applying grounded theory analysis techniques, I identified experiences, training, and organizational policies that have either enabled or discouraged these service providers from offering a comprehensive range of services that include training and other flexible work practices to their client firms.

Through the use of grounded theory methods, I identified four constructs that are common to the three centers: (a) control, (b) discrepant values and behaviors, (c) definitions of training and development, and (d) experiences. The four constructs form the basis of the analyses of the three centers.

This chapter begins with a description of center commonalities, which are a result of the centers' affiliation with the NIST MEP system. The commonalities are followed by definitions of the four constructs, which were derived from data gathered during the interviews and include the constructs' dimensions. The center analyses follow, explicating and corroborating the definitions and the dimensions identified in the constructs.

The Mission of the National Institute of Standards and Technology

The service providers in this study were stakeholders in three manufacturing extension centers affiliated with the National Institute of Standards and Technology's Manufacturing Extension partnership (NIST MEP) program. All three centers share broad common goals because of their affiliation with the NIST MEP system. The goals are significant for this study because all centers are evaluated by NIST on such criteria as the number of client manufacturing firms they serve, the level of impact of their interventions with firms, and the revenue they generate. In September 1998, NIST initiated a new evaluation system based on the Malcolm Baldrige National Quality Award criteria. These new criteria are: (1) center leadership, (2) center planning, (3) center customer knowledge and relationships, (4) center performance information and analysis, (5) center workforce practices and work environment, (6) center

process management, and (7) center performance. Until the new criteria were initiated, centers were not evaluated for providing training to their staff. Nor were the centers encouraged to provide workforce-related services to their client firms. When they did provide workforce-related services to their clients, they received no incentives for so doing. Indeed, they were cautioned by NIST to limit the amount of training activities in which they were engaged to ensure they were not distracted from their original technology transfer goals and objectives.

Since early 1998, however, all MEP centers have been charged by NIST to make a transition to high performance work practices in their own centers, as well as to provide services to their client firms with services that will lead the firms to high performance practices. Workforce-related activities are a critical component in definitions of high performance.

The Constructs

The three centers' individuality became evident from the data provided during the interviews and information gathering processes, demonstrating the autonomy that exists throughout this national system. Yet, identifiable similarities exist among the centers' attitudes towards training and other flexible work practices, forming patterns of behavior among them, regardless of their differences. Applying grounded theory coding methods suggested by Strauss and Corbin (1990, 1994, 1998), I identified four common constructs from the data gathered during interviews with the various centers' stakeholders: (a) control, (b) espoused theory v. theory-in-use, (c) definitions of training and development, and (d) experiences. The constructs explain the enablers and barriers that encourage or discourage implementing training and other flexible work practices in an MEP center or in a client firm.

The following definitions of the constructs emanate from the data gathered during the interviews with the three centers. The same terms may have different definitions and connotations in other contexts.

Construct 1: Control

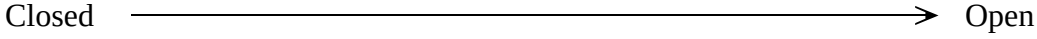

Figure 1. Dimensions of Construct 1

In this study, *control* refers to practices associated with decision-making authority. The interviewees spoke about the different styles of management practiced in their centers and observed in client firms. The two ends of the control continuum are anchored by perspectives on how one runs an organization and treats the people who work there. At one extreme is a strict, hierarchical, traditional manager who creates rules, gives orders, and expects strict adherence to the prescribed ways of behaving. The person in charge manages most, if not all, processes and procedures in the organization. In that circumstance, control means being and staying in charge, without relinquishing any of that charge to so-called underlings in the organization or to outside consultants. This approach implies a lack of trust in others' abilities to look at a situation, weigh

the pros and cons, and then make a decision on how to proceed. Behavior is not a key indicator of control, because one can be a "nice guy" and still want to remain in charge. In this case, control connotes conceit, because of the presumption that "the controller" is the only one who can make correct decisions. According to the interviewees, some managers perceive as threatening giving their employees even some of that control. If these managers are not in charge, they do not know what to do. A possible consequence of their fear of losing control is to reject all aspects of training and other flexible work practices.

The other end of the continuum is characterized by the manager who is willing to share information and responsibility with employees. Typically, that manager has a strategic vision that includes a progressive human resource system as a key component. This style of management lends itself to organizations that are described as "high performance." When an organization's managers decide to move towards high performance work practices, they must relinquish control over some staff decisions, activities, work flow, etc.

The issue of control is a critical component in a firm's movement towards high performance. If the person in charge is unwilling to share, i.e., relinquish control of knowledge with employees to enhance their understanding of their jobs and the company, to enable opportunities for them to share in decision making, or to contribute to the firm's success in other meaningful ways, then work practices cannot evolve towards high performance.

The interviewees mentioned leadership continually throughout the interviews, typically as a critical resource for relinquishing control that enabled employees to become involved in their organization's success. Whenever organizations – both the centers and the client firms – were described with the qualities of high performance, the speaker included strong and visible leadership as a key driver. The speaker always described a manager who had a vision for his/her organization that included an emphasis on people systems as a good leader and acknowledged that manager as able to share his/her power and control.

Open codes (and their definitions) that contributed to this theme included, but were not limited to: "empowers" (provides opportunities for staff development and other flexible work practices); "anti-empowerment" (against the concept of empowering workers); "attitude towards training" (the way the speaker feels about training or describes others' attitudes towards training); "devalues" (the speaker articulates and demonstrates negative attitudes towards training and other flexible work practices or describes others' negative attitudes towards training); and "HPWO" (high performance work organizations). Additional codes that described the leadership end of the continuum included such terms as: Code words such as "change" (the difficulty encountered in trying to change people); "flexible workplace" (workplace characterized by practices such as ongoing training, cross training, pay for performance, team organizations, information sharing, etc.); "leadership" (the leader's role in guiding the group towards high performance work practices); "internal marketing" (exposing field staff to the benefits of new work practices so they will adopt them willingly); and "propensity" (tendencies towards certain behaviors) contributed to the analysis.

Construct 2: Discrepant Values and Behaviors

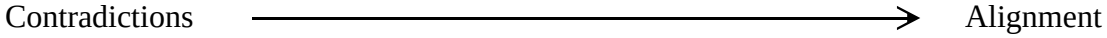

Figure 2. Dimensions of Construct 2

What people *say* they believe about staff development and other human resource practices and what they actually *do* are often quite different, exemplifying the concept of discrepant *values and behaviors.* All of the stakeholders spoke about training in very positive terms, indicating the criticality of improving staff knowledge, skills and attitudes. They implied that providing training adds value to an organization's overall functioning. The contradiction between belief and action occurred when they qualified the circumstance under which training may not be appropriate, as seen in the following codes: "attitude toward training"(the way the speaker feels about training or describes others' attitudes towards training); "conditions for training" (the time, place, and circumstances when training will work); "devalues" (the speaker articulates and demonstrates negative attitudes towards training and other flexible work practices or describes others' negative attitudes towards training); and "small business" (the limited/challenging role for training in small businesses). This qualification of when training is appropriate raised an important question: If training is a value-added commodity, why does it only add value in certain settings or organizations or with certain people?

An additional layer to the discrepant values and behaviors use construct became evident in the interviews. The contradictions between the two theories took two forms:

(1) The espoused values with regard to the importance and criticality of training were contradicted by either omitting the training altogether or by severely limiting the context in which training could occur, i.e., the spoken theory overstated the theory-in-use;

(2) The espoused value minimized implementing training and other flexible work practices. However, the actual implementation demonstrated a higher regard for initiatives such as staff development, employee inclusion, and mentoring than the interviewee seemed to realize. In those cases, the spoken theory understated the theory-in-use.

Construct 3: Definitions of Training and Development

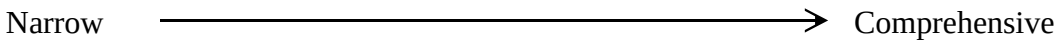

Figure 3. Dimensions of Construct 3

The ways in which some of the interviewees described training and development, i.e., the settings, the techniques, and even the subject matter, suggested narrow definitions of development and training in the workplace. The responses they provided indicated they have varying levels of understanding of the concept. By omitting many of the options included under

the rubric of "informal education" in their definitions, i.e., providing coaching, mentoring, or shadowing in the setting where the knowledge is used, they demonstrate that they are missing opportunities for expanding, improving and developing employees' skills, knowledge and abilities.

At the opposite end of the continuum, many interviewees demonstrated an understanding of all aspects of adult education. Specifically, they cited on-the-job, experiential, and informal learning and explained the opportunities for learning that exist in their workplaces at all times.

I coded the varying definitions of training and development with the following terms: "definition of training" (the speaker's definition of training); "training skills" (providing training opportunities for staff); "informal training" (ways to provide training in a nonformal setting, sometimes unbeknownst to the speaker); and "attitude toward training" (the speaker articulates and demonstrates negative attitudes towards training and other flexible work practices or describes others' negative attitudes towards training).

Construct 4: Experience

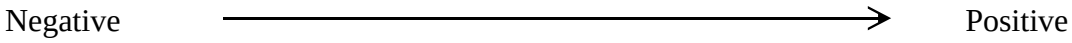

Figure 4. Dimensions of Construct 4

People seem to model the behaviors to which they have been exposed, including how they learn new knowledge, skills and attitudes in the workplace. Center staffs' academic and professional experiences with training and other flexible work practices affect their attitudes toward recommending and implementing these activities with the client firms to whom they are providing assistance. If they, themselves, have not worked in organizations that have these progressive human resource practices in place, they undervalue their effectiveness, especially in the context of small business. Or if they, themselves, have had negative experiences with aspects of high performance work practices, they question their applicability for their client firms. On the other hand, if they have had positive experiences with training and other flexible work practices in prior jobs or have been educated to understand and implement these practices, they are far more willing to introduce them in their centers or to their client firms.

The following codes resulted in this construct: "background" (the speaker's prior work experiences that encouraged or discouraged training and other flexible work practices); "challenges" (the difficulties faced with hiring and training competent staff); "conditions for training" (the time, place, and circumstances when training will work); and "experience" (the speaker's current experiences with training and other flexible work practices).

Center One

Introduction to the Center One Case Study

The Center One study was the most comprehensive of the three. I interviewed more people and attained a broader picture of Center One than I did the other two centers in the study. I was especially interested in Center One because they reported no human resource engagements on their NIST Activity Data Log. However, I found that their understanding and application of training and other work flexible work practices belies their reported activities.

Interviewees

I interviewed the following people to gather information about Center One:

The Center Director. The Center Director was hired in late 1996. While the center had received its MEP charter almost a year earlier, there was no staff in place when he was hired. Consequently, he has built the organization "from scratch," as he said. Atypical for the MEP system, the Center Director did not come from a technical or engineering background. Instead, his background is selling and marketing. He believes in the importance of presenting a positive attitude, one that exudes confidence and competence .

Field Engineer A. The first field engineer to be hired, Field Engineer A was quickly promoted to Sales Director. He is part of the center's management team and has supervisory responsibilities for the twelve field engineers who are based throughout the state. In addition, he continues to work with clients, selling appropriate services to them. Field Engineer A has undergraduate and graduate degrees in chemical engineering. Additionally, he has a master's degrees in business administration. Prior to joining Center One, he worked in private sector manufacturing environments.

Field Engineer B. Field Engineer B was hired in 1997 as Center One increased its cadre of field staff. Prior to joining the MEP system, Field Engineer B was a civilian engineer for the military, and he also worked in a large manufacturing environment. His undergraduate degree is in mechanical engineering; he has a master's degree in business administration, as well.

Small Manufacturing Enterprise (SME): SME represented two roles in this study; he is both an executive vice president of a 50-year-old, 60-employee heavy machinery manufacturing company and a member of Center One's board of directors. SME has been with his company for 12 years, following his graduation from college with a degree in mechanical engineering. Now a member of the company's management team, he still maintains some design responsibilities, primarily because the company has too few employees for its successful business. SME has been on Center One's board of directors for the past two years.

NIST Regional Manager. The Regional Manager, one of six regional managers currently on the NIST staff, has held this position for close to three years. Therefore, he was working with

Center One at the time they hired the Center Director. He came to NIST following his employment at a regional MEP center. Since he works with several other centers throughout the system, he offered a comparative perspective about Center One.

In combination, the five interviewees presented a broad picture of the center's organization, management, priorities, and operations. As one might expect, their views of the topic of training and other flexible work practices were diverse, indicating their differing experiences, attitudes, and beliefs.

Center Background

Center One is a statewide center that links the state's technical and business management resources with the needs of the state's small manufacturers. While field engineers provide some direct services to their client firms, their primary responsibility is to broker the expertise of the state's service providers. Sales skills are considered to be critically important to the success of Center One's field staff.

The center was approved as a NIST center in late 1995; the current director was hired nine months later. Prior to his being hired, no staff were in place. Instead, whatever activities the center provided to small manufacturers were delivered under the auspices of the state's technology institute. During the Center Director's tenure, the staff has grown to twelve field engineers located around the state who work independently from their home offices, plus three staff members in a central administrative office. A statewide enterprise, Center One serves manufacturers from urban, suburban, and rural environments.

When they are invited into a company, center field engineers identify services that would increase manufacturers' productivity and efficiency by assessing their existing practices with a standardized assessment tool. They provide the assessment free-of-charge. If the client firms are interested in following up on the recommendations from the assessment, Center One refers and introduces them to one or more appropriate service provider whom the center considers as a partner. These partners include public institutions and academic institutions, such as community colleges and state technology institutes, and technology centers. Public technical resources are supplemented, as necessary, by private providers. The client manufacturing firms pay a fee for the services, and the center receives an administrative fee for their involvement. Client firms pay Center One directly in those instances when the center is the actual provider of services.

Since its inception, Center One has undergone a change in its mission. In the words of Field Engineer A:

> One of the key things that we found out is that when the charter was established about two or three years ago, we thought we would take these technical solutions and all of this technical expertise from various centers to the small manufacturers and help them to improve the quality of the products, or help to cut the costs by improving yield, or make them more automatic machineries, offer them more technology.

> But it so happens that we found that that's not what they're looking for....[T]hey are looking for more help in marketing, sales, international trading, workforce training, information technology, and internal communication or procedures, rather than real technology....So now we are building up other resources...to come up with other solutions (Appendix A: 1).

Center One has introduced training to all of its field staff to address the above mentioned change of priorities. They provide all field staff with a training course on sales skills; a course on manufacturing extension is mandatory for all center staff also. Finally, other training opportunities are provided to the field staff as needs occur. The motivator for all of this training is the realization that the technical backgrounds of the Center One staff provides only one component of the competencies needed to work effectively with the client firms. Field Engineer A described the training that the typical field staff needed:

> ...[T]he technical people don't have...strong communication and interpersonal skills and that's where there's a gap....[T]hey sometimes get very frustrated because they need a very structured project and program. Once they know what they're supposed to do, they implement very readily. But most of them had some tough times and are dealing with initial stages of building the relationship and trying to understand this concept of the manufacturing extension program (Appendix A: 2).

Analysis of the Data

The five Center One stakeholders all spoke eloquently and ardently about the need for training for center staff, as well as for employees in the client firms. The center's changed mission – from transferring technology to providing a full range of business services – required new skills for the field engineers, including sales and marketing. The manufacturing firms' needs for future workers and for incumbent workers who have different skills, e.g., computer expertise or competence with new, more advanced equipment, call for multiple vehicles to teach people new ways to perform their work. All of the interviewees acknowledged that some form of flexible work practices contributes to differences in the workplace. Finally, they all agreed that the MEP staff and client firms had to be exposed to new skills and opportunities.

While in general agreement on the above issues, their responses indicated identifiable differences about the ways in which they value training and other flexible work practices. For example, when asked about training that is external to the Center, i.e., providing training and other flexible work practices to a small manufacturer, the interviewees' attitudes diverged. The Center Director was adamant that the twin limitations of time and money made training a luxury for most small manufacturers, and he made a very compelling case for not bothering with training in the small manufacturing environment. The two Field Engineers, on the other hand, believed that small companies have the ability to invest in their workforce when they are made aware of the benefits that accrue to the company as a result of that investment. SME, representing the small manufacturing firm, said that his company provides cross training, competitive salaries, bonuses, and increasing amounts of responsibilities to employees who

demonstrate skill and commitment to the company. However, even those who were most supportive of introducing these progressive processes to small companies acknowledged that organizing and administering companies in that mode was challenging when the companies are recalcitrant towards change or are undercapitalized. They also observed that it is especially challenging when companies lack a good strategic plan.

Construct 1: Control

Center One interviewees identified different styles of management that they observed or practiced in small firms that ultimately affected the quantity and quality of training and other flexible work practices provided to employees. These management styles covered the range of the control continuum, from authoritative and closed to inclusive, communicative and open. The Center Director expressed concern about offering employees too much training, responsibility or information, observing that production and productivity are often effected negatively by these offerings. Yet, SME's experience with his small manufacturing firm utilizing principles of high performance, e.g., providing training as needed, sharing information with workers, providing career paths, establishing a progressive compensation system, has resulted in increased performance and increased profits. His company has also enjoyed a loyal staff and experienced lower staff turnover. Regardless of these measurable successes, the manager who must remain in control is reluctant to run his company in that sort of environment.

The management and culture at the MEP center add another layer to the firm's decision-making process regarding training and other flexible work practices. If the center field engineer is ambivalent about the concept himself, working with the firm's management to change its mind is unlikely. If the field engineer believes in the concept, however, he may schedule another visit in several months, just to check in and remind the firm that these services exist. Both Field Engineer A and B and the Center Director talked about trying to engage firms in more systemic approaches to business management in subtle ways, i.e, as they are working with the firm on other projects, they may introduce or remind the firm about including people systems in their management portfolio, but in a subtle way. If Field Engineer B encounters resistance but senses at least some interest in learning more about people systems, he will reschedule an appointment in six months and attempt to re-introduce the concept. None of the Center One staff said that they persisted in encouraging these practices with firms that exhibited strong resistance.

Field Engineer B described his experiences with some small manufacturers when he tried to introduce activities for educating their staffs on how to improve their work practices:

> When you empower the workforce and cross train the workforce, that can be threatening to an owner. The empowerment in itself means that I have enabled this worker to make decisions or give him additional training and he becomes more valuable. He or she may demand more money or better working conditions. And with the economy being what it is, that person can go to seek employment elsewhere with the new training.

> I know one reason that companies don't write procedures down and have things visual for a worker is they don't want to lose control. So I tell him or her what to do. That way, I have the knowledge, I have the power. And so when we have companies create work procedures and work instructions, visual aids that represent an investment in time and writing them down, then you are, in effect, giving away what knowledge and what power I have over my workforce (Appendix A: 3).

The Center Director also questioned the value of empowering a small manufacturer's workforce. At several times during the interviews, he took on the persona of a small manufacturer. During one of these instances, playing the role of an owner of a small manufacturing firm, he said, "I don't want to empower 'em. Because they're going to ask me questions. And if they're asking me questions, then they're not working, I'm not making money. That's reality" (Appendix A: 4).

In another example, again adopting the identity of a small manufacturing company owner, the Center Director said:

> But the bottom line is...you know what?...You don't know what it is to have to be there on a Thursday and figure out how you're going to have to get another $20,000 to make payroll on Friday. And if you ain't been there, you don't know. And then somebody wants to sit down and talk about empowerment and training? (Appendix A: 4).

The need to control one's employees, i.e., their schedules, their activities, and their decision-making on the job, could have several different origins. For example, when small business owners have started their company from scratch and watched it grow, they often have settled on only one way to run that company. They believe sincerely that the result of any other mode of operation can only be chaos, because no one else can possibly possess the depth of understanding that comes from founding and growing one's own company. In addition, the owner can become possessive. His sense of ownership is so strong that he believes no one else has the right or the ability to run the business, nor does anyone have the right to even suggest such a thing to him. His management techniques are derived from behaviors learned long ago, and he is unwilling to change them.

SME described owners of companies in terms of the characteristics listed above:

> We deal with a number of local manufacturers and, typically...they're a small organization, maybe a half dozen to 15 employees. And generally, it's a family type of business. A guy will start a business 30 years ago, when there were a lot of machinists out there. Guys would get their training and journeyman's papers, work for a couple of years, and then they'd buy a milling machine and a lathe and start a business in their garage. And they would just grow and grow and grow. Typically, that's how small machine job shops have gotten their start.

> Nowadays, those fellas who started those businesses 30, 35 years ago are getting to be 60 years old....Typically, what I think has happened is that they had a good run of business, but in a lot of cases, these small organizations haven't kept with things like ISO[4] or various quality systems of that nature that maybe some of the bigger manufacturers are going to be looking for from jobbing shops. So there are some that have, some that haven't.
>
> The ones that haven't have seen their business decline over the years, and find that it's getting tougher and tougher to do business. And in a lot of cases, they're not going to go into the next generation, simply because the money's not there. People are just basically working to pay their bills and maybe get a little bit ahead. But, I think they're going to have a tough time implementing all the things they need to implement now. I think it's just a matter of too little, too late for some of these organizations. And I don't know really how they're going to pull it together to do all of those things in terms of training and upgrading systems and equipment. Not so much with equipment, I guess. Most places seem to keep up with that. But in terms of training and putting in place the facilities to meet things like an ISO requirement, I don't think most of these small manufacturers are going to be able to do it (Appendix A: 5).

The Center Director described his own experience with attempting to empower his staff in a previous job:

> The one thing I've learned is empowerment doesn't work with 90 percent of the people. People don't want to be empowered, you can't force them to be empowered, and if you over-empower, which I did, you get all kinds of problems....I found it didn't work because you need people that are educated, you need people that want to be empowered to do it, and most people don't. Most people want to be led. And it's real hard to get people to do that....Empowerment can be a dangerous tool. Empowerment, it doesn't give you a free ride to do what you want. It's free reign within a set of parameters and structure to get things done within a certain time frame. And to get it done as a team (Appendix A: 6).

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[4]The International Organization for Standardization (ISO) is a worldwide federation of national standards bodies from some 130 countries. Increasing numbers of corporations are meeting the prescribed standards identified by the ISO, i.e., documented agreements containing technical specifications or other precise criteria to be used consistently as rules, guidelines, or definitions of characteristics, to ensure that materials, products, processes and services are fit for their purpose. In turn, these companies require their supplier firms to meet these standards as well. The terms "ISO 9000" and "ISO 14000" refer to families of standards under these generic titles for convenience. Both families consist of standards and guidelines relating to management systems, and related supporting standards on terminology and specific tools, such as auditing (the process of checking that the management system conforms to the standard). Available Online: <http://www.iso.ch/index.html>. February 24, 1999.

Enablers and barriers.

A force field analysis[5] is a tool that can be used to identify the multiple resistant forces that center field engineers will encounter as they attempt to work with their clients on training and other flexible work practices. From the client firm's point of view, some possible resistant forces are: (1) a lack of trust of employees or outside consultants; (2) the company's heritage (especially meaningful in family-owned businesses); (3) an unsuccessful prior attempt at modifying their management techniques; or (4) cost considerations. The company management could be very comfortable with the current modes of operation and, therefore, question the reasons for making any changes. Or, managing this endeavor may be the only successful initiative in the manager's or owner's life. To give it up to another individual or a group of individuals may feel like giving up the only positive activities he/she can identify.

A force field analysis can also be used to identify driving forces that enable a transition to high performance. Field Engineer A described his experience with some small manufacturers with which he has worked, illustrating company success, i.e., increased productivity and profits, as a driver for implementing flexible work practices. Following is his observation:

> But we have found that all across, especially the companies that are profitable, who are very productive, who are very competitive, who are growing reasonably well or are keeping their head above water in a very tough competitive situation, the companies are heavily, heavily involved in training and upgrading the skills of their staff (Appendix A: 7).

SME described benefits that can be accrued by small companies willing to invest in training and other flexible work practices to enhance their day-to-day management. I had asked him if he would describe his organization as "high performance," in today's management parlance. He responded, "Given that we are a heavy manufacturing type of operation, I don't know if we would term ourselves as being innovative or progressive in that respect." However, as he went on to describe their hiring and promotion procedures, ongoing training, career path, informal training and mentoring, and bonus program, this company, with its 60 employees, has implemented flexible work practices and demonstrates characteristics of high performance. And, according to SME, "It's worked out real well. I know it's a little bit different than a lot of places, perhaps, but we're...[W]e've been able to prosper really beyond our expectations" (Appendix A: 8).

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[5]A force field analysis, as developed by Kurt Lewin, is a problem solving technique that is based on the concept that any problem or situation is the result of forces acting upon it. These forces, e.g., habits, customs, attitudes, both drive and restrain change. In terms of solving the problem, "[i]t is more effective to weaken the restraining forces than to increase the strength of the driving forces" (Hoekstra, H., Vink, M., Tjang, R. & Fa, A.(No Date Given) *Force field analysis.* Available Online: <http://wwwhome.cs.utwente.nl/~om_prj/MEE98/misop016/node2.htm>. February 5, 1999).

A final barrier for moving from a controlled environment with the center is a function of NIST's data collection policies. Numerical goals such as center sales quotas and NIST engagement quotas, exacerbated by some ambivalence about training and flexible work practices, constitute possible driving and resistant forces.

Construct 2: Discrepant Values and Behaviors.

Center One stakeholders provided many examples of discrepant values and behaviors as they described their attitudes and behaviors vis à vis training and other flexible work practices. The contradictions between the two took two forms: (1) the spoken values with regard to the importance and criticality of training were contradicted by omitting training or limiting its context, i.e., the spoken theory overstated the theory-in-use; and (2) the spoken value minimized implementing training and other flexible work practices, but the actual implementation demonstrated a higher regard for initiatives like staff development, employee inclusion, and mentoring than they seemed to realize, i.e., the spoken theory understated the theory-in-use.

The spoken theory overstated the theory-in-use.

All of the interviewees extolled the benefits of a trained workforce regardless of the industry or kind of workplace, including the small manufacturing environment. They commented about the importance – indeed, the necessity – of training for all workers. However, these affirmations were qualified or even negated when the topic moved to providing these services in a small manufacturing firm.

The Center Director, especially, questioned the practicality of training in a small company. He observed that training works well in large firms, not-for-profit organizations, and government offices, describing them all as organizations that are not driven by the day-to-day profit concerns of the small manufacturer. When asked about research that has shown that training can increase productivity and profits even in small firms, he questioned the relevance of academic research to so-called real world situations. Again portraying a small business owner, he said:

> So let me be sure I understand this. You want me to take five technicians for five days and you want to train them at the factory. That's 1600 a day times five. That's 8,000 of gross profit you're taking out. No thank you. You know, for one day, a Saturday, down here. That's the deal (Appendix A: 9).

Undoubtedly, he was sincere when he questioned providing training in a small firm. As an advocate for small manufacturers, he seeks to protect them from wasting valuable time and money on something that he perceives as a luxury at best. But his statements about the value of training conveyed a double message. On one hand, he lauded the virtues and importance of training for everyone. Yet, his dismissal of the value of training for the small manufacturing firm demonstrated the difference between his spoken value and his theory-in-use.

This phenomenon is best exemplified by the Center Director's concluding statement on the topic of training in the workplace. After talking about the training opportunities he provides his own staff, he said, "But again, would I do this if this was a private sector company and if I had to turn a profit every day? Probably not. Probably not. Because I just can't have people off the line" (Appendix A: 9). To limit the circumstances in which training and staff development are provided and valued is to portray a strong difference between espoused and actual beliefs and behaviors.

The interviewees' responses represented the diversity of opinions with respect to training and other flexible work practices that exist in Center One. Engineer A told of how he values training for all workers, including small manufacturers, and provided examples of progressive small manufacturers with whom he has worked. He explained that when the field staff enter a company for the first time, they assess a full range of needs, one of which is training and human resources. However, in practice, no priority for training and other flexible work practices is demonstrated.

Field Engineer B, who is a proponent of such integrated manufacturing practices as "lean manufacturing[6]," tries to encourage his client firms to take a holistic view of their organization, which includes the firm's people practices. When he comes up against client recalcitrance, he lets a designated period of time pass before he makes a return visit, at which time he hopes he will find the client more amenable to his earlier suggestions for introducing more progressive work practices. Field Engineer B is articulate about his belief system with regard to high performance work practices; he welcomes any opportunity for working with a company to implement such a system. His willingness to continue to introduce these concepts is limited by the client's acceptance of new ways for approaching the firm's management.

Client recalcitrance is obviously a restraining force for moving ahead with training-oriented projects. Plus, the Center One staff have to "make numbers," which influences the kinds of projects they pursue with their clients. The center's charter comprises a final restraining force; it requires them to refer training activities to their partner organizations. Interestingly, these behaviors contrast with SME's experience with flexible work practices, e.g., cross-training, bonus plans, and career paths, which suggest that small companies can be good candidates for such practices.

<u>The spoken theory understated the theory-in-use.</u>

The Center Director provides the center staff with many opportunities for training, in both formal and informal settings. As he described ways in which he involves his staff and the ways in which he encourages small business owners to engage their employees, he provided many examples of informal learning; however, he seemed to undervalue the training benefits that could

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[6]Lean manufacturing is a methodology that utilizes processes and procedures that eliminate all waste, including materials, time, space and redundant work by employees.

accrue from these informal learning opportunities. By limiting his definition of training to "removing people from their regular work," he undervalued the effects of the opportunities he was providing staff.

The Center Director's comments can be contrasted with SME's whose list of firm practices fit the descriptions of high performance work organizations. These included his firm's practices in their hiring and promotion procedures, ongoing training, career path, informal training and mentoring, and a bonus program.

Construct 3: Definitions of Training and Development

The ways in which the Center One interviewees described training and development, i.e., the settings, the techniques, and even the subject matter, suggest that some of their definitions of development and training in the workplace are narrow. Their responses indicated varying levels of understanding of the concept. Some of their definitions omitted activities typically included in descriptions of informal education, e.g., providing coaching, mentoring, or shadowing in the setting where the knowledge is used. They demonstrate that they are missing opportunities for expanding, improving and developing employees' skills, knowledge and abilities.

The Center Director, for example, defined training as removing workers from their place of work for a specified length of time to learn identifiable skills. By limiting his definition of training and development to traditional educational offers, the Center Director precluded many cost effective informal and less formal training and development approaches that could help employees in a small manufacturing firm develop and maintain their competence.

Ironically, when it comes to his own staff, the Center Director expressed enthusiasm about providing training opportunities, both by word and by action. He described such informal learning opportunities as including his staff in board meetings and strategic planning activities. In addition, he includes role playing and other learning activities in staff meetings. By so doing, he provides continual opportunities for his staff to practice skills that he thinks they should possess to work effectively with their clients. He distinguishes these development activities from training because they take place within the every day work environment.

Once again, the interviewees' responses indicated varied opinions among the center staff. Field Engineer B had a broader definition than the other center interviewees.

> I see it happening at the work site on the equipment. I can see it in a classroom. I can see it being done one-on-one, or I can see it being done in a group setting. It can be done at a library or on the Internet or looking at visuals or text. I think you have to look at the application or the requirement and decide which is best based on the knowledge and the skills and the environment of the trainee (Appendix A: 10).

Field Engineer B's knowledge of learning environments is broad and inclusive for one who resides outside the training universe. However, engaging small business owners in the

implementation of these techniques requires more than just knowledge of what they are. Restraining forces similar to those identified for the discrepant values and behaviors theme are barriers here, also. Specifically, client recalcitrance, quantitative center metrics, and the center's operating charter all push on Center One to address issues other than training. By so doing, center staff have few opportunities to expand their understanding and, consequently, their definition of training and development in the workplace.

Enablers and barriers.

The interviewees' own formal education, the training opportunities they have been afforded in their respective jobs, or their view of the results of training they have provided their employees serve as drivers that will either narrow or enhance their definitions of training and development. Some Center One interviewees attempt to remain current with professional literature on the topic of human resource development, which is a challenge, given their broad responsibilities with client firms. Nonetheless, they tended to have broader definitions of training and development. Concomitantly, they placed a higher value on the benefits of training and other flexible work practices.

Construct 4: Experience

The experiences of the various interviewees affected their perspective on the value of training and other flexible work practices. Field Engineer A seemed disposed towards training, having been provided staff development opportunities when he worked for a Fortune 100 manufacturing company. Field Engineer B's exposure to the military's high priority on training, supplemented by his manufacturing systems experience, provided him with an understanding of the value of workplace learning and empowering workers on the line. He said:

> And I make recommendations around having people who are doing the process involved because we do not come in and tell them what to do. Our approach is to train them and empower them to make the changes themselves. And that's part of it. So you, owner or production manager, must be willing to accept that when you empower your employees, you're going to be giving up a certain amount of control (Appendix A: 11).

Additionally, there are small firm owners and managers who believe that training and other flexible work practices are an expense, not an investment. They fear that if they offer training to employees, they will take their new skills to a new employer. The companies have nothing to gain by offering training and other flexible work practices, according to this reasoning.

SME implemented flexible work practices in his manufacturing company, saw the benefits to the company, and has been encouraged to continue to offer his employees multiple opportunities for continuous improvement. The Center Director, on the other hand, had a negative experience with empowering his staff in the past; the result was that he felt as though he had given away too much power to his employees. As cited earlier, his learning from that

experience was "empowerment doesn't work with 90 percent of the people. People don't want to be empowered, you can't force them to be empowered, and if you over-empower, which I did, you get all kinds of problems." As a result of this experience, the Center Director consistently qualified the appropriateness, the efficacy, and the necessity for introducing training and other flexible work practices into the small manufacturing environment.

Center Two

Introduction to the Center Two Case Study

The data gathered from Center One provided a wide range of experiences along the continua associated with the four constructs. It provided excellent examples of field engineers working with client firms, providing services that ranged from the traditionally technical to the more holistic. Hence, the focus of interviews with Center Two, a center that is making the transition to holistic service provision, was on how they were helping to prepare their staff and their client firms to continue their evolution toward high performance.

Interviewees

I interviewed the following people to gather information about Center Two:

The Center Director. The director joined the center in September 1995. Prior, she held positions in a Fortune 100 manufacturing firm and a national consulting firm. Since she began her tenure at the center, the number of field staff has grown from eight to 14 and revenues have multiplied more than 500 percent. Her undergraduate academic background is technical in nature; her graduate degree focused on organizational systems and change.

Field Engineer C. Field Engineer C was hired in 1995, shortly after it became an MEP center and preceding the Center Director's arrival. Formerly a teacher, she joined the center in search of a new career. During college, she worked at a local manufacturing establishment. Currently, Field Engineer C works with as many as 20 companies on various projects, many of which have a strong workforce-related component.

Center Background

Center Two is one of several regional centers in its state, part of a state regional technical assistance system which has been in existence for over 15 years. The center received its first NIST MEP grant about four years ago. Center Two has three field offices that provide consulting services to small and medium-sized manufacturers' in its region of small urban centers and rural communities. The center adheres to a direct service model, meaning that its field staff provide services to clients, rather than brokering all (or most) services through its partner organizations, as does Center One. While Center Two has built a diverse staff who offer a comprehensive range of services to its client firms, in about 35 percent of their engagements, they partner with

other public and private providers to ensure they are utilizing the most appropriate resources for their clients. When partner organizations are involved, Center Two staff retain project management responsibilities, which allows them to remain in contact with the client and with the client engagement and to make certain the client is served well.

The mission of Center Two is to assist the region's small and medium-sized manufacturers in ways that will allow the companies to remain solvent, to grow their business, to become more effective competitors, and to increase their profitability, i.e., to strengthen, expand and diversify firms. While the mission has remained the same since the center's formation, the means for attaining that end have evolved over the past three to four years. Since the current Center Director assumed her position in 1995, about one year after the center received its NIST MEP grant, Center Two has enjoyed significant growth. The Center Director attributes their success to "[t]eaching people how to become consultants, recognizing what the constancy of purpose and the mission is [sic], and just exploiting it" (Appendix B: 1). The center staff is organized into teams that provide services to clients in the following areas: business startup, manufacturing assistance (including process improvement; business assistance; information technology; and group projects and networks), and technology commercialization.

As center leader, the Center Director identified one of her responsibilities as providing staff with the skills they needed to become consultants to small manufacturers, a role they had not practiced consistently prior to her becoming director. She observed that the typical center field engineer joined the MEP center with good problem solving experience *within* his/her organization. However, MEP field staff are required to solve problems from *outside* the organization. And, according to the Center Director, "It's a whole different set of skills to solve problems within an organization than it is to solve problems as an outsider" (Appendix B: 2). Her responsibility, as she saw it, was to provide the center staff with training, examples, experiences and opportunities to learn these new skills.

The Center Director began her career at the center working with a few staff members to streamline specific processes that everyone was required to use. She contended that if processes are in place for recurring activities, time becomes available to work on more creative initiatives. One example is proposal writing, a task that all field staff must complete. Before she became director, the field staff spent up to 24 hours collectively creating new proposals each time they wanted to initiate a client engagement. The field staff now use an on-line template; the proposal writing process now takes about an hour and a half. The additional time previously spent on writing proposals is now spent on more value-adding and creative ways working with clients.

About half of the field staff remained after the Center Director assumed her position. Some left for other positions, while others left because they were unable to align with the organization's direction and style. Interestingly, she was told by some that the leadership style was too rigid and by others that leadership demonstrated too much flexibility. In her interview, the Center Director said that no one way is more right or more wrong; instead, "...the issue is optimization...An organization is an organism; it's a living, breathing organism. It is not a

collection of individuals. It is a collection of individuals acting together towards some common aim" (Appendix B: 3). The staff who left were replaced with people who were more able to find alignment of values, and the number of staff has increased from eight to 14 as a result of the influx of contracted work.

In Center Two, field staff have combined responsibilities for selling projects and providing services to client firms. Everybody has some responsibility for consulting in their area of expertise. Those staff who have primary sales responsibilities spend only about 20 to 30 percent of their time consulting. Conversely, those who are primarily project people typically spend about 20 to 30 percent of their time marketing the center's services.

Skills transfer and client education are underlying themes and important components of all client engagements. According to the Center Director, "...[W]e never want to be back in the same company doing the same project again...[T]here's a training component in every engagement, so that we never have to come back again and so that we can transfer skills" (Appendix B: 4). Field Engineer C mentioned this tenet, too. "We want to walk out of there and have given them the tools [so] that they can carry it on and continue to refine it themselves. Instead, we go on to work on other things with them" (Appendix B: 4).

Analysis of the Data

Internal and external training are important components of Center Two's work, integral to their center administration and to their work with client firms, as well. Both the Center Director and Field Engineer C have had responsibilities for providing new information or techniques for the field staff. The Center Director said that, upon her arrival at the center, she "...observed the practices, in some cases radically changed them to create order around what they were doing" and started training people herself because she had difficulty identifying outside training that met the center's needs. Concurrently, Field Engineer C provided her co-workers with some of the administrative training required for smooth center functioning.

External training is also an important part of Center Two's activities. Currently, Field Engineer C's primary responsibilities include working with client firms and assisting them with various workforce initiatives, including training and other flexible work practices. She manages region-wide groups and networks on workforce-related topics, including total quality management.

While significant, training is rarely the ultimate goal of the engagement. If no other partner, e.g., a community college or university, is available, then the center will provide skills transfer to the client firm on its own. The center prefers that their client firms recognize the systemic aspects of their work and their organization and learn how to do their work differently, followed by a decision to bring the center staff back to work on another problem or issue and to learn from that engagement, too.

Concurrently, Center Two staff are engaged in their own learning, demonstrating characteristics of a learning organization. Their new skills are helping them to work better with one another and with their clients. Field Engineer C described her peers, many of whom come from technical backgrounds, talking about their client engagements.

> It's interesting to hear them talk. The project people themselves occasionally will meet to work on internal processes related to conducting work. For example, tools and techniques that they want to develop so that they're all using similar things and not recreating something over and over again – to cut down on time. So they'll meet together and they'll work on special little projects that they want to implement internally for processes for project people (Appendix B: 5).

Construct 1: Control

Center Two presented examples of control, at both the center and the client firm levels. Within the center, examples were primarily on the open end of the control continuum. The client firms exemplified varying points on the continuum.

Within the center.

The Center Director joined an existing center, albeit a relatively new center in the MEP network. Nevertheless, she walked into an organization with an existing culture and with employees who had established ways of working – on their own, with colleagues and with clients. She identified a lack of standardization with regard to many of the center's consulting processes, e.g., the way in which field staff prepared proposals for prospective clients. When she began with the organization, the field staff were writing proposals for each of their new engagements as though they had never written a proposal before. Rather than using a template which required a minimal amount of creativity for the routine elements contained in all proposals on the proposing field personnel's part, e.g., center capabilities, they were spending a lot of time authoring sections. With that process, multiple days went by before proposals were submitted to inchoate clients. According to the Center Director, all of that time would have been much better spent providing technical assistance to clients.

Using her prior experience where she initiated standardized procedures for various activities, the Center Director worked with Field Engineer C and others to identify techniques for reducing the multiple ways in which staff were performing recurring and redundant tasks, beginning with proposal writing, and presented these ideas to the staff. The Center Director acknowledged that, in addition to her background and her training, she has a propensity for creating order from chaos which she has always exhibited. In the interview, we spoke of "hard wiring" to describe these characteristics in an individual.

Independent of one another, the Center Director and Field Engineer C described the Center Director's approach to effecting change at the center, using similar examples and similar language. They spoke specifically about the time they spent examining existing processes, their

efforts at aligning the center's internal and external activities, and their introduction of these new concepts to the staff. The Center Director's vision was clear, but it required the staff's agreement and participation if it was really going to work. When asked if convincing the field staff to adopt new techniques was difficult, Field Engineer C said that they began with tools that would help them with tasks that they didn't enjoy, like writing proposals, and gradually introduced more complex concepts. The Center Director talked with the staff at length, with the intention of helping them to understand the direction in which she had been hired to lead the Center. As mentioned earlier, about four of the original eight staff remained, while the other four departed. Some of those who left did so because they were unable to align themselves with the new structure and value system.

The Center Director assessed the organization and established a clear vision for the center based on her assessment and her knowledge of the ways in which organizations perform, which is significant data on the control continuum. Some may interpret this action as controlling in the closed, authoritarian sense of the word. Indeed, the Center Director's definition of empowerment includes taking action on an idea, not just mulling it over passively, without any implementation plan. In cases like that, she said, employees risk having the power moved to someone else.

However, the fact that she (1) articulated her vision, (2) engaged the staff in implementing the vision, (3) trained them in the use of new tools and techniques that eased their concerns, (4) provided them with help for getting their work done more easily, and (5) assisted them in aligning all of their activities towards serving their customers better are indicative of a high performance orientation. By nature, she explained that she prefers standardization and order in her life. But it is not order for order's sake. Instead, she articulated her belief that when there is order in processes and procedures and all activities are aligned systemically, there is additional and valuable time for initiatives that require more creative thought. The leader has to understand his/her organization and its members very well to be able to identify how all of the pieces of the system fit together.

Recognizing the needs of the center staff if they were to make a successful transition to embodying practices of external consultants for their client firms, the Center Director introduced methods for implementing the transition to the staff incrementally and consistently. They began with measurable, helpful processes that people would find useful. They have evolved into self-managed teams with shared responsibilities for helping client firms learn to solve specific problems. Implementing these processes required significant learning of new skills and attitudes, and it appears to have been worth the effort. The benefits to the center can be seen in their increased revenues, increased numbers of clients served and repeat business from many of those clients, and, finally, increased numbers of employees in the center necessary to meet the clients' needs.

Within client firms.

Both the Center Director and Field Engineer C spoke about the presence of leadership in client firms that helped to ensure a forward movement vis à vis training and other flexible work

practices. Field Engineer C stated that the majority of the firms with which she works comprehend the value of high performance work practices, even if they do not know to use that terminology. She was emphatic about the need for leadership's involvement if the firm is to include people systems activities in their day-to-operations. She said:

> If you can convince the leadership it's important, usually everyone else will fall in line. Although not always. There are always a few. But for everyone I've been putting into training lately...it's all been very accepted because their management thought it was important (Appendix B: 6).

In spite of a high percentage of firms that comprehend the value of training and other flexible work practices, Field Engineer C acknowledged that some of the businesses need "convincing" that training and other flexible work practices have value beyond increasing the workers' knowledge base. These businesses do not understand these costs to be investments rather than expenses.

In her work with groups that are comprised of participants from many different companies convened to solve specific problem area or to learning a new concept, Field Engineer C reported that she can identify readily those employees who work in companies where managers exhibit traditional control compared to those who work in companies where management is disposed towards training and other flexible work practices. The former are far more reticent in the group initially; they are less likely to offer suggestions or to ask questions. With encouragement, their comfort level increases and they usually lose much of their reticence. However, whether they maintain their new confidence when they return to their firm when they return to their more traditional, authoritarian, control-oriented companies is uncertain.

Enablers and barriers.

Both the Center Director and Field Engineer C described their propensities for systems thinking and their experience with quality systems as enablers in their definitions of how control is imposed in the workplace. They both placed a high value on inclusion as a way to engage all levels of employees in an organization, emphasizing the concept of the organization as an organism where treating one element has an effect on the entire entity. They observed the same qualities in client firms with leaders possessing the same propensities. If not already demonstrating characteristics of high performance, these business owners or managers were good candidates for introducing these work practices into their firms because of said propensities.

A possible barrier to successfully operationalizing the open, empowering leadership end of the control continuum is the need for consensus building as expressed by the Center Director. She said, "If I can build consensus, get everybody at 80 percent, then it's a done deal." That can slow the process down significantly. The Center Director acknowledged that she can not always wait for consensus before moving ahead with an initiative or a change, but her preference is to do so.

Construct 2: Discrepant Values and Behaviors

Center Two's attitude and approach toward training and other flexible work practices appear to be consistent. The center management emphasizes their importance and provides opportunities for its implementation. Engagements with centers encourage skills transfer and other informal learning opportunities.

However, the Center Director, who was hired for the purpose of facilitating the center's transition to a consulting organization, found several examples of philosophies contradicting observable behaviors as she became better acquainted with the center. In her initial interviews with established staff, they told her their concerns and the ways in which they believed these concerns could best be solved. She heard consistently that they were very happy that she had joined the group because, as a group, they were in need of the skills that she brought to their organization. Yet, as she began to introduce new standardized processes for some activities that they had done differently in the past, she began to see resistance. She observed:

> People outwardly want order and people outwardly want somebody to come in on the white horse with the silver banner, but when push comes to shove, they want somebody to come in and tell everybody that their way is the correct way. Not to have somebody come and put a new process in place....They [want to be able to] say, 'That's what I've been telling them all along' (Appendix B: 7).

Their spoken theories and their actions are contradictory, and, as happens with most people in this circumstance, it occurs without their even knowing this conflict exists (Argyris, 1990).

The spoken theory overstated the theory-in-use.

The Center Director's experience exemplified attitudes about changing processes, responsibilities, roles, or behaviors. A common aphorism is the prevalence of change in our society, at large, and change in the workplace, specifically. People speak about this phenomenon often and readily; yet, when they have to make those changes themselves, they exhibit reluctance. Or they believe they are behaving differently when, in reality, their behaviors are very similar – or even identical – to the behaviors they purport to have changed. In the case of Center Two, some of the employees, who were already employed at the center when the Center Director arrived, reconciled the requested changes with their espoused theories and found they could thrive in the new environment. Others were sufficiently challenged as they tried to align the two conflicting theories that they left to find new jobs.

As the Center Director recalled the staffing changes that occurred after her arrival at the Center, I inferred that the employees believed sincerely that their espoused values complemented the new center's new direction. However, as the new expectations for their engagement with clients became more clear to them, the gap between their espoused values and their actions were untenable. Change was acceptable to these staff members so long as the changes reflected their own preferences and comfort. When they had to move beyond these levels of comfort, they

questioned the Center Director's ideas. Either on their own or with her encouragement, they sought other places of employment with a better alignment between their beliefs and their overt behavior.

The spoken theory understated the theory-in-use.

Field Engineer C explained in great detail the various ways in which the center team with whom she works coordinates their planning and their actual work with clients. She was especially complimentary of their respective skills and the ways in which they were all able to use these skills to best serve their clients. The team was also actively involved in the hiring decisions that were made as the staff expanded over the past two to three years. In addition, Field Engineer C had high praise for the Center Director and the ways in which she had explained her vision and involved staff in operationalizing new processes and procedures. Center Two operates a very participative environment. Nevertheless, Field Engineer C was surprised when I observed that they demonstrate qualities of high performance, saying, "Well, I wouldn't have defined it that way previously. We're just so concerned about what's best for our customer" (Appendix B: 8).

Enablers and barriers.

The most prevalent examples of enablers in the construct of discrepant theories and behaviors were implied by the interviewees' use of the words "constancy of purpose," i.e., maintaining a clear vision and behaving in accordance with that vision, and "alignment, " i.e., ensuring that motivations, actions, roles and responsibilities, processes, etc., are all focused on the same outcomes. Both interviewees mentioned and, more importantly, gave examples of how the two theories tracked one another. Their adherence to these two principles of constancy of purpose and alignment enable them to integrate their respective espoused values and actions.

They encounter barriers to operationalizing an aligned, congruent organization when they face recalcitrant field staff or client firms. These are people who articulate an interest in making changes, but, when direction is provided, they either cannot or will not make that transition. Field Engineer C's experience indicated that thoughtful planning and consistent exposure often helped the resistors among her client firms make the transition. Nonetheless, the recalcitrant participant is a barrier to effecting alignment between discrepant values and behaviors.

Construct 3: Definitions of Training and Development

As observed earlier, Center Two places a high priority on skills transfer and client education in all of their client engagements. In addition, the center staff receives ongoing training to help them perform their work more easily and to improve their consulting skills. Center Two demonstrates a wide range of training and development activities, ranging from traditional classroom training to formal networks focused on specific topics to informal learning. Field Engineer C, whose responsibilities include workforce development initiatives with client firms, is a certified secondary math teacher, and she has taught in her community's adult

education program. The Center Director is not a professional educator, but she articulated a tacit understanding of adult learning principles when she said, "If you understand how people learn and how people behave and how people change, then you recognize how absurd it is to say, 'Well, I told them once. And now they have to do it'" (Appendix B: 9).

Within the center.

The Center Director perceived her leadership role as a teacher as well as the center's manager. Her experience as a private consultant reinforced her contention that a different set of skills are required to solve problems within an organization than are necessary for solving problems as an outsider. When she was hired as director of the center, charged with the mission of transforming it to a consulting organization, she found a staff skilled in their respective technical areas, but lacking consulting skills. Therefore, she assumed the role of trainer for this particular set of skills; she devised an instructional plan to provide staff with the skills necessary to make the transition to their new roles and responsibilities. In this trainer role, the Center Director introduced new concepts and new tools, providing the staff with nonformal adult educational opportunities. Additionally, she was available as coach and mentor for the staff as they moved into their new roles, exemplifying an informal learning method of conveying and reinforcing new information and behaviors.

The Center Director capitalizes on her ability to impart new information to people. She explained this ability as understanding the ways in which people listen and then shaping her message accordingly. She also talked about how, in her role as center leader, she has a responsibility for helping all of the staff understand the center's new mission, regardless of their learning styles and preferences. The best way to impart knowledge and skills, she believes, is through experiential learning. She said, "I believe adults learn best by experience. And so if we can be coaches and mentors to make sure they get the right experiences, then they'll learn best" (Appendix B: 9).

Field Engineer C reiterated the Center Director's statements and attitudes about adult learning and the importance of providing formal and informal learning to provide clients with the skills that will enable them to solve the problem themselves the next time. When she assumed some training responsibilities at the center, she began by focusing on the center staff. She brought them up-to-date on some NIST procedures and other administrative responsibilities, and she trained them on specific topics, for example, quality standards. Her training enabled the staff to do their jobs better and more easily.

Within the client firm.

The Center Director's emphasis is to build skills transfer into every engagement, even if the client does not identify training as a goal. When activities are proposed, training may be included in the proposed engagement, but it is offered in the following manner:

> ‘You really need to look at implementing cellular manufacturing.’ It would be more typical for us to say that and have as one of the work plan elements that we’ll train everybody, than it would be to say, ‘You really need to train your people on how to work in cells’ (Appendix B: 4).

Field Engineer C mentioned that almost all of the firms with which she works are convinced of the value of their employees. They realize that money spent on developing their people is an investment, rather than an expense. Otherwise, the firms lose people in an environment where retaining staff is difficult. Nonetheless, she acknowledged that some of the firms, especially the small, family-owned business, need some convincing about the value of training. Field Engineer C said that creativity in approaching the problem and providing the solution is the correct response. She said:

> But, there’s always ways to get around it. You can run two sessions, you know, one during first shift time and one during second shift time. Or, for one instance, we had to provide some documentation training for ISO for one firm, and they couldn’t get large enough blocks of time together – like eight hours together at a time. So we broke it up into afternoon sessions or morning sessions, and they just flip-flopped. They set up two groups. So it was two sessions in one day of the same material....If [you don’t get around it], they’re probably at risk to lose the employee if they don’t let them get the training....You can call it any number of other things, but it’s still training (Appendix B: 10).

Field Engineer C was adamant about the value of a firm’s investing in its people. She described it in the following way:

> The second largest cost center within the organization is payroll. That’s their people investment. They don’t always understand that there are ways to reduce certain costs associated with that, make it work better....It may be a training issue. [Or] maybe it’s other interventions that are needed....But if they could understand that some of the largest investment, beside equipment, they’re making in the company and that they want to make a profit from [is their people]...(Appendix B: 11).

By demonstrating informal learning techniques, i.e., being a coach and a mentor to her client firms, Field Engineer C conveys that message to those who are reluctant to invest in people. Hers is a purposeful approach, intended to instruct and enhance learning, and a good example of her broad definition of training and development.

Enablers and barriers.

The Center Director’s and Field Engineer C’s respective backgrounds, propensities, and strongly held views about the value of providing employees with varied and frequent opportunities for learning serve as enablers for their expanded definitions of training and development. Facing staff or client firms that are reluctant to participate because of their own

lack of understanding are barriers center staff have to face as they try to introduce new knowledge, skills and attitudes to their constituencies. They both approach these barriers with creative ways in which to engage staff and clients. Believing strongly in their goal, they stay with the task at hand and find new techniques for imparting the knowledge. However, in some cases, they have realized that the change they are trying to effect is being met with a greater resistance than is worth their effort, and the person may be better served by working elsewhere. Neither Field Engineer C nor the Center Director has narrowed her definition of training and development. Instead, they realize their audience's limits which, ultimately, may result in the employees' finding a more appropriate place to work.

Construct 4: Experience

One would expect formal training to contribute to an individual's expertise in a particular field or issue, and with Field Engineer C, that is precisely the case. Her college degree in education, combined with her teaching experience at the secondary and post-secondary levels, prepared her to understand the importance of training for all employees in the workplace. Those skills, combined with her quality assurance and manufacturing experience during college, readied Field Engineer C for the new Center Director's emphasis on working with client firms in new and different ways. Field Engineer C credited the Center Director with helping her to put all of the pieces together to form a more holistic way to work with her center team members and with her client firms. The result is that she is an enthusiastic proponent of training and flexible work practices, encouraging those attributes in the clients with whom she works. Her experience in all of the component parts, combined with her propensity for systems thinking, enabled her to make the transition to a more comprehensive way of performing her work.

The Center Director, while not having the formal education background as Field Engineer C, has developed respect for and a keen understanding of adult learning principles throughout her work experience. For example, the years that she spent working in a major consulting firm provided her with lessons about how to be a change agent outside of an organization. During that time, she received extensive training – explicit and implicit – on the knowledge, skills and attitudes that would prepare her to be a good consultant. About that experience, she said, "I learned how to be the best....[I]t has been a lot of work, but...relatively easy to know what to do next. Having time to do it is always a challenge, but knowing what to do next is not" (Appendix B: 12). She imparts these skills to her own staff continually, basing their utility on her prior experience, her strong capabilities in both applying and teaching these skills, and the success that Center Two has experienced since she became the director.

Enablers and barriers.

Mere exposure to a concept is insufficient to make the concept meaningful. Developing meaning requires interest, good instructors and role models, and a propensity for performing the job well. The Center Director and Field Engineer C both possessed these characteristics which served as enablers for them to learn from the experience to which they were exposed. Their

respective work experiences also provided opportunities to practice their skills under the direction of a coach or mentor, which continually reinforced their experience.

Barriers to experience are based on the same forces. If one does not have interest, instruction or a propensity for thinking about organizations holistically, he/she may not be able to make that transition. In describing small manufacturers, the Center Director identified a strength that makes them good at what they do: "What makes many of them effective is the ability to tune out the rest of the world and only focus on one or two things and do them well" (Appendix B: 13). She followed her observation by asking the question, "Why would we expect them to be any good at looking at the big picture where there are hundreds of complexities?' (Appendix B: 13). This finite focus, combined with strong, but very specific, abilities and limited interests, are barriers to learning from new experiences.

Center Three

Introduction to the Center Three Case Study

The interviews with Centers One and Two provided examples from the extremes on the four constructs' continua. They also provided examples of the role of leadership that guides technical people towards providing holistic services. Both Centers One and Two are relatively new to the MEP system. Therefore, I was interested in learning about the practices of an established center as it helps its field engineers to make the transition towards providing more holistic services to firms. One of Center Three's Home Office (central office) administrators whose responsibilities include providing training and human resource development to field engineers provided insights into that phenomenon.

Interviewee

I interviewed the following individual to gather information about Center Three:

Home Office Administrator. The Home Office Administrator has responsibility for organizing all center-wide training and development activities for the center's field staff, which number about 80. He joined the Center Three organization in 1994 at one of the center's Regional Offices; he joined the Home Office administrative staff two years later and was promoted to manager of training in 1996.

Center Background

Of the three centers in this study, Center Three has the longest tenure in the NIST MEP system. In its eighth year of operation, Center Three is comprised of a cadre of Regional Offices, which cross state borders. Regional Offices have been added to the center's roster over a period of years. Center-wide, the staff, including administrative, office, and field staff, number close to 120 employees. Approximately 80 of those staff are field engineers. The Regional Offices vary in size; the average office size is from eight to 12 employees, including administrative and field

staff. The smaller offices, located in rural areas, are staffed with two to four people. Each Regional Office is in partnership with a local entity. The Center Three field engineer is an employee of the partner entity as well as of the center. In most cases, the partner organization is a university or another post-secondary institution.

In Center Three's nomenclature, the central headquarters office is referred to as "the Home Office" and the network of field offices are referred to as "Regional Offices." The Home Office does not serve client firms. In some aspects of its operations, Center Three is decentralized. The Regional Offices determine their respective service priorities based on the needs of current and inchoate client firms. Decentralization is reinforced by the system's administrative structure, in which educational institutions host field engineers and participate in client engagements. Additionally, state departments of economic development and business councils are affiliated partners.

Yet, Center Three demonstrates centralization in its functions, as well. The field staff are employees of their host institutions. The hosts are responsible for administering the field staffs' human resource functions according to their respective policies and procedures, including compensation, benefits, training, vacation, sick leave, performance appraisals, promotions, etc. The Home Office's role is to track and pay performance bonuses and to provide supplemental training and development opportunities. With regard to human resource management, the Home Office role is one of supporter, consultant, and advisor. In terms of direct compensation, the Home Office conducts ongoing compensation surveys to ensure compatibility and competitiveness, and provide the information to Regional Office management and host institution human resource decision makers. The Home Office is involved in determining the Regional Offices' fiscal budgets and ongoing management of those budgets.

Centralization occurs in others ways as well. Home Office marketing staff ensure a unified corporate presence throughout the Regional Offices, and the Home Office also organizes and informs Regional Offices of seminars that may be of interest to client firms throughout their large region. These seminars are taught by regional staff and, where appropriate, private consultants. In addition, Home Office staff participate in all of the Regional Offices' NIST evaluation activities, including preparing and submitting all evaluation data to NIST.

The Home Office convenes staff from all of the Regional Offices for training and other staff development activities at least twice per year. At those sessions, Home Office personnel structure activities that will enable the field engineers from all Regional Offices to become better acquainted with one another and to learn about their Center Three colleagues' capabilities. Center Three staff also use the sessions for structured problem solving and to identify new directions for their center system.

Center Three has identified eight core areas in which Regional Office staff work with their client firms: quality, manufacturing processes, business systems, marketing, information systems, human resources, product development and testing, and company assessments. Within the core area of human resources, field staff have provided the following services to client firms:

employee empowerment; organizational communications; performance programs; position evaluation and profiling; personnel recruitment; team building and training; training and development - planning and delivery. However, these human resource services do not represent the skill set of all 80 Center Three field engineers. The Home Office Administrator observed that different Regional Offices' staff have varying amounts of expertise in these human resource capabilities.

Analysis of the Data

Center Three has trained its field staff to perform their administrative responsibilities since the center was established. As the center expanded the size of its region, bringing all of the field staff together annually became increasingly necessary. The field staff was so dispersed that they had few opportunities to talk with and hear from Home Office staff or to spend time with one another without a mandatory center-wide meeting. Initially, the information conveyed at the meetings was primarily administrative in nature and delivered in traditional ways, meaning that forms were distributed, examples were given, and information was conveyed in lecture and question-and-answer format.

A guest speaker at the 1996 annual staff meeting provided an alternative to the usual ways in which these meetings had always been conducted. An exceedingly creative presenter, he involved the attendees in exercises and discussions that were quite unconventional compared to meetings they had attended in the past. According to the Home Office Administrator, the fact that field engineers participated in that first meeting was a credit to both the speaker's ingenuity and to the field staff's abilities to suspend judgment. From that time on, however, these annual meetings have evolved from administrative, operations-oriented sessions to two days of skills and competency-based instructional and practice sessions. The Regional Offices and outside vendors provide the training, and an effort has been made to use creative methods, e.g., skits or videos. In addition, regional staff give their input for some of Center Three's decision making processes. In addition, over the years, the hiring practices have evolved from hiring single-purposed, process oriented engineers to more broad-based, holistic, business specialists. The training strategy for both the Regional Offices and Home Office has been to provide more holistic, broad-based training to the more technically-oriented person. According to the Home Office Administrator:

> In the early days, a body was a body. There was less hiring based on market needs and more hiring based on getting somebody in there because they had a position approved and there was a certain amount of business in their region and we needed a certain number of field engineers to do it. In the beginning, everybody was an engineer....But what I've seen is that as the core capabilities have expanded to include more general business issues, that, yes, we've hired people who are not necessarily engineers. They have wider backgrounds, experiences and education (Appendix C: 1).

The Home Office Administrator explained that this change in staff selection and retention methods is attributable to a combination of changes in both the clients' needs and Center Three's

capabilities. With input from its issue area advisory councils and with continuing discussions at its staff conferences and other structured staff gatherings, the Home Office and Regional Offices agreed to categorizing their work into eight core capabilities: quality, manufacturing processes, business systems, marketing, information systems, human resources, product development and testing, and company assessments. Since identifying the core capabilities three years ago, the Home Office has used them as a template for organizing almost all of its activities, for example, service delivery, training for staff, marketing, advisory councils, etc. The Home Office Administrator described these core capabilities as "a general umbrella" which demonstrate a wide range of individual capabilities.

Staff training has always been an important theme in Center Three's operations, which the Home Office Administrator credited to the Center Director's belief in providing staff with information that they need to do their jobs well. Over the years, the content and the vehicle for delivering the content on a center-wide basis have evolved from administrative and operational to substantive content areas that were frequently lacking in the field engineers' training and experience, e.g., sales or business services. These topics were often delivered by outside vendors and consultants. In addition to the center-wide training opportunities at the twice yearly meetings, the Regional Offices are encouraged to provide their own training and other learning opportunities to staff. Additionally, since the field staff are typically co-employed by post-secondary educational institutions, they can take advantage of that institution's educational benefits. The training and development activities offered by Regional Offices are provided independent of the Home Office's training plan. That is, Regional Offices can determine on their own if and when learning opportunities best fit their staff's needs, without the Home Office's approval or even its knowledge.

Regardless of their continual emphasis on training, field staff are not always enthusiastic participants in all aspects of their training. The Home Office Administrator explained:

> The warm and fuzzy stuff is not as popular, warm and fuzzy being the loftier concepts, as opposed to the more basic. [I]t's hard to get them to focus on things that they don't face on a day-to-day basis. Everyone is so concerned with and is always so focused on – and it's the nature of the business – they're focused on their time and what's demanded of them....Based on how much they're bringing in depending on how much time they're spending with clients. It's hard for them to set all that aside and see past that (Appendix C: 2).

Even with the aforementioned reluctance, Center Three is moving towards a more holistic approach to its service delivery its client firms, reflecting changes in the firms' priorities and the Home Office's own development. The Home Office Administrator described the transition.

> I think it's sort of reflective of changes in the industry....[Y]ou're a small business, you bring in somebody to work on your technical issues and they prove themselves in that area. And then you start to look for other improvement areas....And I think it's only a natural transition to watch it go from technical to holistic (Appendix C: 3).

Construct 1: Control

Within the center (including Regional Offices).

The Home Office Administrator described Center Three as an organization that functions as both a centralized and decentralized manner, with varying degrees of control. Concerning the corporate identity, uniform administrative procedures, and interactions with NIST, Center Three's director and management staff insist that all of the Regional Offices are similar. However, as he described the ways in which the Home Office is run, the Home Office Administrator never indicated these initiatives were functions of management's need to retain decision-making authority because they lacked trust in the various Regional Office directors to make those decisions themselves. Instead, the decisions were made to establish standardization among the Regional Offices. The goal was to minimize the differences among the Regional Offices' administrative and operational procedures. Standardization reinforces the concept of multiple service providers able to offer a comprehensive array of services across a large geographic area.

Center Three's training attitude and practices illustrate how they allow autonomy among the Regional Offices while, simultaneously, providing standards and boundaries for Regional Office performance. Regional Office staff are required to attend the twice yearly training that is organized and administered by the Home Office staff. Above and beyond that, the Regional Offices may choose staff training and development initiatives that address their own needs. Since the entire organization, which includes the Home Office and the Regional Offices, have developed their goals and objectives through a collaborative strategic planning effort, the staff development activities selected by the Regional Offices will necessarily be in alignment with the goals and objectives of Center Three in entirety. Given this planning structure, Center Three's goals should be inherent in the Regional Offices own goals and objectives and, therefore, be visible in the training they select. The effect is one of a continuous loop, with each part of the organization attempting to meet the same goals and objectives as the remainder of the organization.

At Center Three, *control* emerges from goals and objectives that provide a structure within which the Regional Offices have some degree of autonomy. The Home Office does not define specific ways in which the Regional Offices address their training needs. Each Regional Office is encouraged to meet those goals in the ways that best meet their respective staff's needs. Because Regional Office staff have participated in the process of defining those goals, they do not challenge their origins or their existence. Instead, they attempt to prepare their staffs to meet the goals In fact, the Home Office does not mandate that Regional Office training and development efforts be a standard component of individual performance evaluations. Nonetheless, the majority of Regional Office Directors do include training and development in their performance expectations and performance evaluations.

Within client firms.

The Home Office Administrator described their client firms as gradually gaining an understanding of their firms as systems, just as Center Three and the Regional Offices are evolving toward that end. Comparing that developmental process within firms to the NIST and Center Three's development, he said, "We're...now... realizing that everything integrates with everything else. And, again, I think it's reflective of individual companies and individual centers. It's all part of your evolution where you realize that all of those things go together" (Appendix C: 4).

Not all of their client firms have visions of themselves as systemic organisms, however. The Home Office Administrator described client firms in the following way:

> I would say that the majority of them know that they have specific problems, but they don't know...what causes it. And...they don't really understand the full effect of it....They may think they know the solution, but it usually turns out to be something else. Which usually leads to something else (Appendix C: 5).

As they work together, the field engineers help their client firms see themselves more systemically, which requires looking beyond individual processes in their firms. In turn, the firms' leadership can look beyond the technical problems (typically the catalyst for bringing in the field engineers in the first place) and ask those engineers what other services the Regional Offices can provide to continue their business improvements. This process presumes a high level of trust and willingness to alter the ways in which they organize and manage their firms, which are all elements of relinquishing control.

Enablers and barriers.

The Home Office Administrator has become an enthusiastic student and advocate of systems thinking. The exercise of applying the new Baldrige Award-oriented evaluation criteria reinforced his belief in the need for aligning all elements of an organization with its strategic goals. Training and other flexible work practices are a significant component of that process. His role of manager of training provides him with a platform for providing Home Office and Regional Office staff with the knowledge, skills and abilities to continue what he sees as a natural evolution towards holistic approaches in service delivery. All of the above conditions are enablers for moving all staff towards the empowering leadership end of the control continuum.

As with the other centers, individuals' recalcitrance comprises a possible barrier to moving beyond traditional control to successfully operationalizing the empowering leadership end of the control continuum. This recalcitrance can be found within the Home Office and the Regional Offices as well as within individual firms. The Home Office Administrator has observed a general evolution, but the extremely slow progress can constitute a significant barrier.

Competing expectations constitutes another barrier. Center Three stresses revenue generation as a goal for everyone. How much money one brings in comprises a significant influence on one's compensation because of the center's bonus plan. While increasing these revenue goals, the Home Office is also requiring that staff participate in more training and development events and activities. The Home Office wields strong control over these seemingly contradictory expectations which have a direct effect on the individual recalcitrance vis à vis attending additional training events. The Home Office Administrator believes that field staff do recognize and appreciate the value of training. However, field staff are more concerned about attaining their more immediate performance goals. The Home Office Administrator acknowledges the dichotomy of goals and the challenges it represents to his staff development planning and field staff's attitudes about being removed from the field.

Construct 2: Discrepant Values and Behaviors

Center Three's espoused values with regard to training and other flexible work practices are closely aligned with their actions. Training for all staff has always been an important component in their human resource offerings. While one person has been assigned lead responsibility for planning the structure, content and process of Center Three-wide training events, input from staff and other stakeholders continues to be sought to ensure that the training is comprehensible, substantive, and useful for the field staff. Center Three is fortunate to have a person dedicated to ensuring the alignment between their strategic goals and the ways in which they prepare their staff to meet those goals.

The Home Office Administrator expressed his concern that the message about holistic practice is not clear to all field staff and, in turn, to their client firms, because it is difficult to measure. During the interview, he asked, "[I]n terms of high performance,...[y]ou're trying to align training to a specific goal and objective that the organization has set for itself. How do you show that supports that goal?" By continuing to ask questions about the value of training and the metrics that can demonstrate that value, the Home Office Administrator demonstrates the Home Office's ongoing attempts to eliminate differences between its espoused theories and theories-in-use.

In another example, the Home Office Administrator described how both the Center Director and field staff have changed over the years. He attributed it to many different factors, e.g., changes in NIST requirements, including the move to the new evaluation criteria, and expanded hiring practices which have allowed people with broader backgrounds to become field agents. The Home Office's definitions of what makes a good field staff have broadened accordingly. As the Home Office Administrator said, "An effective field engineer, regardless of the situation,...the structure,...their area of expertise, to be truly effective and contribute to the organization, they have to be able to recognize the potential for every kind of existence" (Appendix C: 6). This statement provides an excellent argument for the holistic approach to providing services.

Center Three is striving to ensure consistency between its spoken theories and actions. Throughout the organization, from the director to the field staff, emphasis has been placed on alignment, continuous improvement, and growth. Complementary human resource processes within the Home Office and in the Regional Offices reward behaviors and activities that demonstrate the qualities of high performance. The Home Office Administrator tended to understate his contribution to the Home Office's movement towards high performance, but he appears to have had a great influence on the maturing human resource focus throughout Center Three's operations.

Enablers and barriers.

The strongest enabler for the espoused values and behaviors construct is the Home Office staff's commitment to aligning their strategic goals with all of its operational planning and implementation. By engaging Regional Office staff in the process of defining the Home Office's overall direction in the form of its eight core capabilities and then using those core capabilities as an operational template, Center Three minimizes discrepancies between what they say they will do and what they actually do. Applying the new NIST evaluation criteria, with its categories that address the Home Office's and Regional Offices' operational priorities has enabled everyone to focus on alignment.

Barriers exist, however. The Home Office Administrator, speaking for the field engineers who provide direct services to clients, said:

> And we make assumptions based on things that we want to see and we think are important to the individual field engineers. And they sit out there and are 'busting their humps' and trying to make these goals and working on these projects and billing and doing what they're supposed to do. And they see things like the paperwork they have to fill out, the way they have to submit all of their information, the data they have to do, the surveys they have to complete....If I do any kind of technical training, that's more time away....They see all this stuff as completely, completely unnecessary" (Appendix C: 7).

Reinforcing the importance of alignment among all of the priorities is a challenging barrier for the organization that is evolving towards high performance.

Construct 3: Definitions of Training and Development

Within the center.

As he described the various ways in which he is introducing and reinforcing training and other learning opportunities to the Regional Office field staff, the Home Office Administrator demonstrated a comprehensive definition of training and development. He emphasized the necessity of providing information in ways that engage staff in experiential learning. He modified the Home Office's bi-annual meetings, inviting speakers who would challenge the field engineers to interact with one another differently and to learn new skills. He is a staunch believer

in needs assessments to ensure that his training and the training he recommends are addressing the actual needs of the field staff. Understanding that field engineers may still question the value of the training he provides, he makes every attempt to ensure the time spent on learning new skills actually yields viable results. He said, "When it comes to training and development, I have to provide equally valuable and equally effective things that will help them to improve their value to the small manufacturer" (Appendix C: 8).

In the spirit of continuous improvement, the Home Office Administrator is planning the ways in which training and development activities will continue to evolve. He said:

> I see two things in the future. Just basic career development stuff and creating knowledge and managing more of the information that's specific to each office and making it easily and quickly available to the other offices. It may not necessarily be training, but it's getting into the area of knowledge management. Human capital (Appendix C: 8).

Within the client firms.

Center Three's emphasis on training and development is focused on its field staff, but opportunities exist for introducing these same principles into the client firms. Some field staff have the expertise to do so already. And as the field staff become more familiar with the eight core competencies and specific areas of expertise, they will emphasize more of these services to their client firms with a plan for the manufacturers to incorporate the practices in their own companies.

Enablers and barriers.

The Home Office Administrator is a strong proponent of adult learning principles, training that supports strategic goals, and meeting the needs of his training customers. His educational background is not in education and training; however, since assuming his current responsibilities three years ago, he has engaged in many nonformal and informal learning activities. These professional development opportunities have expanded his definition of education and training. All of these characteristics have enabled him to develop an evolving definition of training and development, which he puts into practice as he plans and implements the staff's education events.

Any barriers the Home Office Administrator must face with regard to this construct are external. That is, they originate with the field staff whose own definitions of training and development may be very limited and who perceive training and development as merely an expense, not an investment. The Home Office Administrator said that the field staff as a population have moved beyond their skepticism about training that calls upon them to be creative or untraditional, and they now support the alternative methods of learning that have become a regular staple of the bi-annual meetings. Nevertheless, some negative attitudes still prevail at times. Field staff complain to the Home Office Administrator about the conflicting demands for

their time, questioning if learning new skills is really the best use of their time when they should be serving client firms.

Construct 4: Experience

While the Home Office Administrator now has responsibility for coordinating the centralized Regional Office training activities and human resource initiatives, he is a relative newcomer to this field. His education on these issues results from a combination of work experience and nonformal educational opportunities in which he frequently participates. The result is that he is now the champion for both raising their standards for learning opportunities and assessing the value of the training that is being offered to the field staff continually.

The Home Office Administrator credits the new NIST evaluation requirements for helping the Home Office to look at itself very differently. Prior to the new evaluation, the center director demonstrated a very traditional management style and the various operational groups in the Home Offices were separate and uncoordinated with one another. Since the introduction of the new criteria, the Home Office Administrator has observed a change in the center director's attitudes about what priorities are emphasized, how they integrate the priorities within the various operational units, and how they are evaluated. As he described it, "[E]ach of us who are responsible for our own little territories were responsible for putting that review together as a team. And we learned a lot about each other that way. And [the center director] learned a lot about all of us" (Appendix C: 9). Since that time, the Home Office staff has been rolling their new priorities out to the Regional Offices with a goal of establishing more of a seamless entity that reflects systemic thinking and operations, aligning expectations for what people do in their jobs with organizational mission and goals.

Enablers and barriers.

Having an outside catalyst for change – in this case, the new NIST evaluation criteria – may provide incentives for learning new ways of performing tasks, managing organizations, or providing training. Nonformal and informal education opportunities enable learning the new behaviors. Practicing the new behaviors enable their implementation even more.

The barriers are plentiful. Without the aforementioned catalyst that provides focus for learning new knowledge, skills, and attitudes, people tend to do those things with which they are the most comfortable. For technically-oriented providers of technical assistance, the case for holistic services is not apparent unless they are provided with learning opportunities that demonstrate their value and application. By providing opportunities for learning, as well as by modeling, these new attitudes and skills, some of the barriers may diminish.

Summary

Differences exist among the three MEP centers whose stories are described in the case studies. They have different histories, constituencies, management styles, and organizational structures. They offer their services to their respective client firms based on different organizational frameworks and using different techniques. Even with these differences, however, four common constructs became evident through the coding processes. In this chapter, I provided descriptions of each of the constructs and how they represented themselves differently in each of the three centers.

Each of the constructs provides one explanation for a center's or an individual's acceptance or rejection of training and other flexible work practices as appropriate services to provide their small manufacturing clients. That is, each construct can stand alone as an independent, non-linear descriptor. However, I found that the significance of the constructs' independence is enhanced by their connectivity in a circular relationship. Their connectivity, as depicted in Figure 5, contributes more to the organization's characterization as high or low performance than if each of the constructs is considered on its own.

I found *control* is a key component for an individual or an organization's willingness to provide opportunities and support for learning new behaviors. The data from the interviews with various MEP center stakeholders, corroborated by the literature on organizational change, strongly suggests that the nearer to the "closed" end of the control continua, the less likely one is to provide opportunities for training and other flexible work practices to one's employees.

The *discrepant values and behaviors* construct connects with *control*. As I probed the interviewees about their own behaviors and the behaviors of their managers and their clients, I found inconsistences between what they say they do and what they actually do. Many managers want to believe that they are at least reasonably open with their employees. Or if they are not, they excuse their own behaviors by pointing out others' weaknesses or by pleading an excuse, such as a limited time or resources. Their espoused value, e.g., of benevolent leader, is contradicted by their actual behavior, which is characterized by withholding information, by imposing rigid standards with no variance on how these standards will be met, or by neglecting to align strategic planning with operations in the organization. Yet, when they are asked to describe their management styles, these same managers are unable to see the aforementioned behaviors. They believe themselves to be interested in the people who work for them, often in the context of what will benefit their organizations, and they do not see that their actual behaviors contradict that articulated interests.

Discrepant values and behaviors also connects to the *definitions of training and development* construct. Staff development is a highly valued commodity in an organization, at least until a choice has to be made between training and bringing money into the center or the company. Meeting revenue goals is a very critical short term need in any organization; budget-related actions are often the final driver for what the company actually does and how they do it. Companies at the "comprehensive" end of the definitions construct are able to see the different

opportunities they can provide their staff which will ultimately have a positive effect on the very things they are concerned about, i.e., productivity and increased revenues. Companies at the "narrow" end may articulate an understanding of the variations on the theme of training and development, but are not willing to take the time or invest the resources to implement a comprehensive training initiative. Yet, they do not see the contradiction between what they say they do (or what they should be doing) and what they actually put in place. According to Bolman and Deal (1991), "Most people, most of the time are unaware of the discrepancy between what they intend and what they do....[Furthermore,] it is unlikely that they will become aware of the discrepancies" (p. 240).

Experience is the final component of the connectivity circle. Without positive exposure, formal training, or encouragement to try new techniques, managers are reluctant to provide training and other flexible work practices to their staff. They reject these practices, perhaps because they are unwilling to give up control or perhaps because their own definitions of how one approaches such a critical issue are limited. Or the managers provide so little in the way of support, the efforts are destined to be unsuccessful, so the managers can proclaim them to be inappropriate to their organization.

Figure 5, the Connectivity Circle, illustrates the relationship among the four constructs and their respective contributions to the tendency to achieve a high performance workplace. Each construct contributes; depending on the center or the individual, one construct may overshadow another. The aggregate effect of the connectivity among the constructs is key to moving towards high performance, more so than if each of the constructs is considered by itself.

All of the above permutations on the four constructs are evidenced in the data from the three centers. In Chapter Five, I will explicate the constructs further and suggest an intervention model for moving an organization towards the ends of the continua that lead to open management, aligned theories of belief and action, comprehensive definitions of training and development, and positive experiences toward training and other flexible work practices, i.e., the transition to high performance organizations.

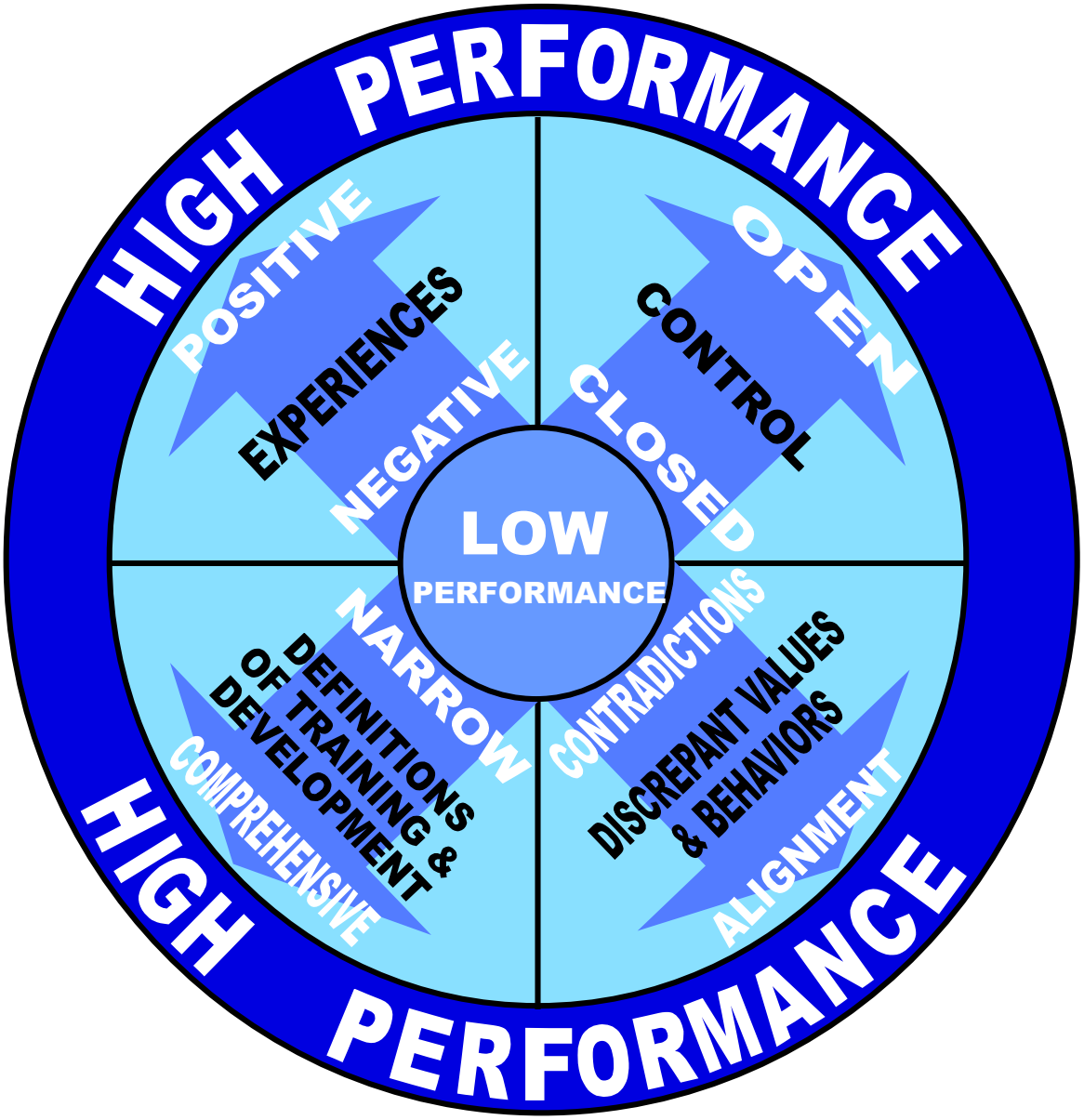

Figure 5. Connectivity Circle

CHAPTER V: FINDINGS AND DISCUSSION

The primary question posed in this dissertation is why some Manufacturing Extension Partnership (MEP) centers include training and other flexible work practices as components of their technical assistance services to their client firms, while others do not. Implicit in the research question is the issue of whether or not training, flexible work practices, and other aspects of human resource development are valued as critical elements of a company's operations. I identified a continuum of behaviors exhibited by MEP center field staff in three centers that are in various stages of offering high performance services to their clients. The identified behaviors resulted from interview data and archival records. I described the centers' stories in three case studies and found that, understandably, individuals' behaviors affect the overall service delivery provided by the MEP centers to their client firms. My analysis of individuals' and centers' behaviors resulted in an intervention model that describes ways in which MEP centers and their staffs can be encouraged and prepared to provide high performance consulting services to client firms.

Review of Questions and Summary Findings

My research focused on the experiences, values, and attitudes held by internal and external stakeholders of MEP centers, a national network of technical assistance providers who offer varying types of consulting services to small manufacturing clients. Currently, some of these centers place a high value on effective people practices, i.e., training and other flexible work practices, and see them as a critical component of their service delivery to client firms. Other centers do not include these services in their panoply of technical assistance offerings. Or if they do include them, the people practices services do not receive the same attention or priority as the more technical services. An assumption of this study was that including effective people practices is beneficial to the client firms and an indicator of the MEP center's own development toward high performance.

My first research question was, "What are the circumstances, i.e., events, policies, attitudes, that either encourage or discourage a holistic approach for assisting small manufacturing clients?" The question sought to identify both organizational and personal enablers and barriers to decisions about offering effective people practices as part of the center's portfolio of services. Organizationally, the influences came from NIST, the centers' federal funder who exercises oversight responsibility; their state charters; their boards of directors' policies; strong leadership imposed by the centers' managers; and market demand. From the interviewees' personal perspectives, understanding the principles of effective people practices resulted from their own experiences in high performance organizations, their formal or informal learning experiences, and their sensitivity to customer needs.

The second question was, "What are the espoused values of MEP center staff who support training-related assistance? What are the sources of these values?" Responses to this question indicated a strong commitment to sharing information and, concomitantly, sharing power with center employees. These respondents reported that implementing training and other

flexible work practices in their own centers or encouraging them in client firms enriched the employees' productivity and commitment to their jobs, their co-workers, and to their employers. Experience, in the forms of their own employment, and their own continuing education (formal, nonformal, and informal) were the reported sources of these values. The more success they experienced, the more they wanted to continue these practices and the higher value they placed on them. They described alignment between their values towards effective people practices and their actual behaviors. Interviewees from centers provided their perspectives based on their own centers' circumstances, as well as from their experience working with small manufacturing client firms.

The third question was, "What are the espoused values of MEP center staff who do not support training-related assistance? What are the sources of these values?" Responses indicated a lack of alignment between espoused values and actual behaviors. All of the interviewees praised the value of training and other flexible work practices for their own organization and for their client firms. However, some also expressed caveats when they discussed training in the context of the small manufacturer, explaining that time and money preclude the small manufacturer from offering training to their workforce. If training is considered to be universally positive, as all of the respondents said, how can it be restricted to specific circumstances? I propose that a need to maintain control of information and, subsequently, power, as well as personal experience and limited definitions of training and development, were the sources of these contradictions between their articulated values toward training and their actual behaviors.

The final question asked – "What are the cognitive processes that account for either valuing or discounting learning interventions?" – sought to understand which of the interviewees' own learning experiences contributed to their attitudes about training and other flexible work practices. Their responses indicated that their own formal education, combined with nonformal and informal learning opportunities, contributed to an understanding of the value of providing all employees with these opportunities. Rather than feeling threatened by employees' increasing knowledge, skills and attitudes, these interviewees understood the benefits that would accrue to the organization, be it MEP center or small manufacturing firm by providing opportunities for expanded learning to employees. This attitude was enhanced by the employees' abilities to contribute to their company's – and their own – well being.

The data gathered from the above questions allowed me to identify enablers and barriers that influence center staff's organizational and personal decisions to include training and other flexible work practices in their consulting services. I collected data from stakeholders in three MEP centers and reported my findings in case studies, which were organized around four identifiable constructs that describe the aforementioned enablers and barriers: control, discrepant values and behaviors, definitions of training and development, and experiences. The case studies informed the development of an intervention model that will assist an MEP center to expand its practice to include training and other flexible work practices, indicators of high performance.

Relating the Key Literature to the Findings

The literature on the value of training interventions in the workplace, especially in the manufacturing environment, is vast. Human resource professionals, university researchers, labor economists, and even the popular press have studied and written about the benefits that accrue to both employers and employees when workers have continual opportunities to learn how to do their jobs better. In Chapter Two, I referenced studies by Arthur (1994); Bartel (1991); Bassi (1995); Carnevale (1988); Fletcher & Alic (1991); Huselid (1995); Jarboe & Yudken (1997); Mirvis (1997), Osterman (1994); Pfeffer (1994, 1998); Ralls (1994); Upton (1995); and Wiggenhorn (1990). These authors, among others, found that training aligned with other strategic initiatives, managed as a process, and placed in the broader context of high performance work organizations becomes a significant contributor to a firm's strategic planning and success. Workers become more creative, more productive, and more committed to their personal success and to the success of their employers as a result of receiving training and participating in other flexible work practices.

Researchers who studied small firms (500 employees or fewer) corroborated the findings that are more typically attributed to large firms. Deshpande and Golhar (1994) found that small manufacturers rated the need for high performance skills higher than large manufacturers did. Rowden (1997) and Wagar (1998) tracked the increased productivity of small firms that have *bona fide* human resource programs, including training. Interestingly, Rowden's (1997) study found that small manufacturers were not always aware of the progressive practices that they offered their employees. Their human resource practices were buried in their day-to-day activities and were simply acceptable ways for them to run their businesses.

Brinkerhoff & Gill (1994), Rothwell (1995, 1996) and Rosenberg (1996) cautioned against implementing training, *per se*, as a stand alone initiative in an organization. Instead, they recommended a focus on human performance technology, in which training is a means to improved output. Also known as "human performance improvement," the concept goes beyond training because it does not stop at the analysis of job-related performance; it also identifies the underlying causes of the performance in question. The result is the selection of solutions that will best improve employee performance in the context of overall organizational performance, which may or may not include training as one of the most appropriate solutions to remedying the problem (Rosenberg, 1996, p. 371).

The interviewees' reactions to the above research were mixed. Some agreed that it was relevant to their current or past experience, while others alluded to the discrepancies between real life and research. The latter group was insistent that small manufacturers must focus on the success of their firms, meaning short-term and immediate goal realization, i.e., meeting payroll or responding to a customer's demand for product. Training and other flexible work practices are perceived to be an expense, not an investment in their company's present and future success. Those who described training as a stand-alone expense, rather than an investment that will contribute to the firm's success in conjunction with other strategic practices, created a false dichotomy: Training or successful operations. The ability of some small firms to integrate

effective people practices into their day-to-day operations, as described by center field staff and the small manufacturing executive, resulted in increased productivity and profits. Their first hand experience belies the limitations proffered by some of the interviewees and corroborates the research findings of Rowden (1997) and Wagar (1998).

The benefits of effective people practices which contribute to high performance work organizations have been described in Chapter Two and earlier in this section of Chapter Five. The original intent of this study was to identify the enablers and barriers that encouraged or discouraged MEP centers from helping their client firms implement training and flexible work practices, thereby assisting them in the transition to becoming high performance work organizations. During the process of interviewing the three centers' stakeholders, however, I realized that the importance of effective people practices was known to and at least verbally acceptable to all interviewees, even those who rejected their relevance for small firms and demonstrated extremely contradictory espoused values and actions. Another category of interviewees appeared to understand the benefits of training and other flexible work practices, and they tried to implement them with their client firms and, often, within their own centers. Nonetheless, many were selective as to when or to whom they introduced these practices. Or they expressed tentativeness about actually implementing these practices in firms or within their own centers.

In addition to providing constructs for the enabling and discouraging behaviors observed in interviewees, the data suggested that an intervention model can portray the ways in which center stakeholders can move towards high performance values and behaviors. And as the individuals move toward high performance, so do their centers. With the center staff appreciating the value of high performance practices, the likelihood that they will introduce their clients to high performance is increased as well. Therefore, NIST's goal of moving the MEP centers toward inculcating high performance practices in their own operations parallels the centers' goals of introducing these practices to their client firms.

The difficulty that proponents of high performance have had in disseminating these new concepts, i.e., training and other flexible work practices, throughout the NIST system, is explained in the dissemination literature. Rogers (1995) described the *innovation-decision process* as a series of phases through which "...an individual (or other decision-making unit) passes: (1) from first knowledge of an innovation, (2) to forming an attitude toward the innovation, (3) to a decision to adopt or reject, (4) to implementation of the new idea, and (5) to confirmation of this decision" (p. 161). The individual or decision unit considers and then decides about the appropriateness of the new idea for ongoing practice. The variable of the idea being new differentiates innovation decision-making from other forms of decision-making (Rogers, 1995, p.161).

In the context of this study, some center staff and small manufacturers have focused only on the technical aspects of their respective environments. The newness of training and other flexible work practices in environments that have always been technical in nature, perhaps even disdainful towards the so-called softer skills, causes MEP center staff to consider whether or not

they want to proceed with the dissemination of these innovations. Some were able to see the long-term benefits of training and other flexible work practices, while others were not. Their movement along the path to high performance was encouraged or disabled by their decisions at important junctures, tracking the model proposed by Rogers (1995).

Research Procedures

Because I was interested in why some centers and their staff were able to transcend their technical backgrounds and offer holistic services that included training and other flexible work practices to their client firms, I selected a qualitative case study for this research. I applied interpretative qualitative research methods, based on the naturalistic paradigm, in order to understand the issues raised in this study. I conducted grounded theory research by completing case studies on three Manufacturing Extension Partnership (MEP) centers, following the principles proposed by Strauss and Corbin (1990, 1998). The interviewees from the three MEP centers responded to questions and engaged in discussions about their backgrounds and experiences, their centers' operations and policies, and their consulting practices. These data, in turn, became the means to sample events and incidents that emerged as a body of information. Ultimately, I used that information to identify categories, concepts, and contexts to create an intervention model for assisting the transition to a high performance organization.

From the beginning of my research, I intended the center selection and study process to be iterative. That is, I planned to conduct a comprehensive study of one MEP center, chosen because it reported few, if any, client engagements in the Human Resource category in the data it submits to NIST. I intended subsequent choices to be based on identifying MEP centers with potential data for corroborating the findings from the previous center(s), demonstrating the practice of theoretical sampling (Strauss and Corbin, 1990, 1998).

The result of this iterative process was five people interviewed in Center One, two people from Center Two, and one person from Center Three. Their information, combined with informal discussions with NIST personnel and archival data submitted to NIST, provided the data to complete the case studies, identify patterns in the interviewees' responses, create constructs, develop the story line, and develop the intervention model.

I conducted the interviews over a six-month period, from August 1998 to February 1999. I interviewed the subjects in person or on the telephone. The interviews were unstructured, i.e., I did not use a pre-determined script. All of the participants willingly allowed me to tape their interviews. I transcribed all of the interviews and coded them, per methods of grounded theory described by Strauss and Corbin (1990, 1998). I used the same coding methods for the memos of the informal conversations. The coding was done using Ethnograph, Version 5.02 software.

Findings

The three MEP centers have different histories, constituencies, management styles, and organizational structures. They offer their services to their respective client firms based on different organizational frameworks and using varying techniques. Even with these differences, however, four common constructs became evident through the coding processes: (a) control, (b) discrepant value and behaviors, (c) definitions of training and development, and (d) experiences. The constructs explain the enablers and barriers that encourage or discourage implementing training and other flexible work practices in an MEP center or in a client firm.

While the differences among the constructs and the ways they behave are significant, the connectivity they exhibit across the centers and with one another are important, too. Their interdependence can be considered as layered, one over the other, to affect centers' and staffs' behaviors in a multitude of ways, that result in their acceptance and implementation of high performance practices.

I found that *control* is a key component as to whether or not an individual or an organization is willing to provide opportunities and support for learning new behaviors. The data from the interviews with various MEP center stakeholders, corroborated by the literature on organizational change, strongly suggests that the nearer to the "closed" end of the control continuum, the less likely one is to provide opportunities for training and other flexible work practices to one's employees.

The *discrepant values and behaviors* construct overlays the *control* construct. Probing people about their own behaviors, especially as they pertain to how they manage their employees, frequently exemplified discrepant values and behavior. As determined as they say they are about being open, empowering managers, their behaviors indicate how difficult it is to implement these management practices consistently.

Discrepant values and behaviors can also be juxtaposed on the construct that addresses people's *definitions of training and development*. Staff development is a highly valued commodity in an organization, at least until a choice has to be made between training and bringing money into the center or the company. Short term goals often override long term goals, both in MEP centers and in their client firms; "making their numbers" takes precedent over mission. Therefore, organizations at the "narrow" end may articulate an understanding of the variations on the theme of training and development, but they are not willing to take the time nor invest the resources to implement a comprehensive training initiative. Yet, they do not see the contradiction between what they say they do (or what they should be doing) and what they actually put in place. Bolman and Deal (1991) have been quoted earlier in this study as saying, "Most people, most of the time are unaware of the discrepancy between what they intend and what they do....[Furthermore,] it is unlikely that they will become aware of the discrepancies" (p. 240).

Experience is the final layer. Favorable exposure, formal training, or encouragement to try new techniques encourage people to provide training and other flexible work practices to their staff. All of the other constructs – control, discrepant values and behaviors, and definitions of training and development – may interfere with centers' decisions to offer training within their own organizations or to their client firms.

Interpretations

My analysis of the data from the three centers identified influences external to center staff's own decision making that encourage or discourage holistic service provision to clients, e.g., NIST policies, boards of directors' directives, and market demand. I also identified internal enablers and barriers, which I categorized as control, discrepant values and behaviors, definitions of training and development, and experience.

Further analysis of the data indicated another phenomenon regarding whether or not a center decides to offer training and other flexible work practices, that of innovation diffusion. The decision to move towards high performance represents a new way of working with clients for those center staff whose backgrounds are solely technical and whose training and background are in technology transfer. If one thinks of high performance work practices as an innovation for MEP centers, the principles of innovation diffusion apply.

Understanding and accepting new concepts is a complicated social phenomenon. It is not characterized by instantaneous behavior. As Rogers (1995) stated "...it is a *process* that occurs over time, consisting of a series of actions and decisions" (p. 162). Rogers' model of innovation-decision consists of five stages:

(1) Knowledge: exposure to the innovation's existence, accompanied by a minimal understanding of how it works.
(2) Persuasion: formation of a favorable or unfavorable attitude about the innovation.
(3) Decision: choice regarding adoption or rejection.
(4) Implementation: application or utilization of the innovation.
(5) Confirmation: decision to continue using or to reject the innovation, in order to avoid dissonance that have followed implementation (Rogers, 1995, p. 62).

Applying Rogers' terminology, the MEP centers in this study have passed through the Knowledge, Persuasion, and Decision stages in their decisions about whether or not to expand their services to include providing training and flexible work practices to their client firms.

- During Phase 1, Knowledge, they were introduced to the concept of high performance via NIST, their own experiences, new center management, or client demands. Their prior experience will influence their new understanding; however, innovations may lead to needs, if an individual develops a need for the innovation only after being introduced to it (Rogers, 1995, p. 164).

- During Phase 2, Persuasion, they formed their attitudes about high performance. They all articulated favorable theories; however, the data indicate that some of the interviewees hold contradictory espoused theories and actions. These emanated from their previous experiences, their limited understanding of training and development, or their high needs for control.

- During Phase 3, Decision, the MEP centers decided to pursue high performance consulting practices or to limit their pursuit with technical and process-oriented services. Their decision must be reckoned with the high performance direction recently introduced by NIST. Nevertheless, other variables, including their state or local requirements, their client base, and their own propensities, can work against the NIST parameters.

The three centers are at different stages in Phase 4, Implementation. Center One is conflicted about the value of high performance practices, as evidenced by the Center Director's contradictory attitudes about the value of training for small manufacturers. The remainder of his staff appeared to be more favorably disposed to high performance practices, but they are unwilling to encourage recalcitrant firms to move from their traditional practices.

Center Two is ensconced in high performance practices, both internally and with their client firms. Their articulated theories and actual behaviors are aligned, and they have identified creative ways in which they work with recalcitrant firms. The two interviewees' experiences and education are conducive to high performance practices, and the confluence of the four constructs contributes to their success. Hiring choices have evolved to match the decision to implement the innovation, i.e., high performance.

Center Three has decided to implement high performance practices, too. Because it is a far larger center than the other two, the Home Office is providing training to their network of field staff in their Regional Offices. The training is helping Center Three's field staff to move through the innovation-decision process. A double tier of Rogers' model exists in Center Three. The Home Office, having passed through all of the phases of the model, is now cascading the process to its Regional Offices. Consistent communication, a mainstay of the innovation diffusion process, is reinforcing the Regional Offices' actions and decisions with regard to offering high performance services to their clients. Center Three, also, has changed its hiring practices to reflect their acceptance of the innovation.

Recommendations for Practice

As stated in Chapter Four, it is the aggregate of the four constructs that is the greatest influence in the MEP center's acceptance or rejection of high performance work practices. Strong tendencies toward high performance are the result of behaviors that fall on the ends of the constructs' continua that represent open control, alignment between espoused theories and theories-in-use, comprehensive definitions of training and development, and positive experiences with training and other flexible work practices.

However, what about the centers that demonstrate behaviors on the so-called low end of the four continua? I propose an intervention model to help move an MEP center towards high performance, as depicted in Figure 6.

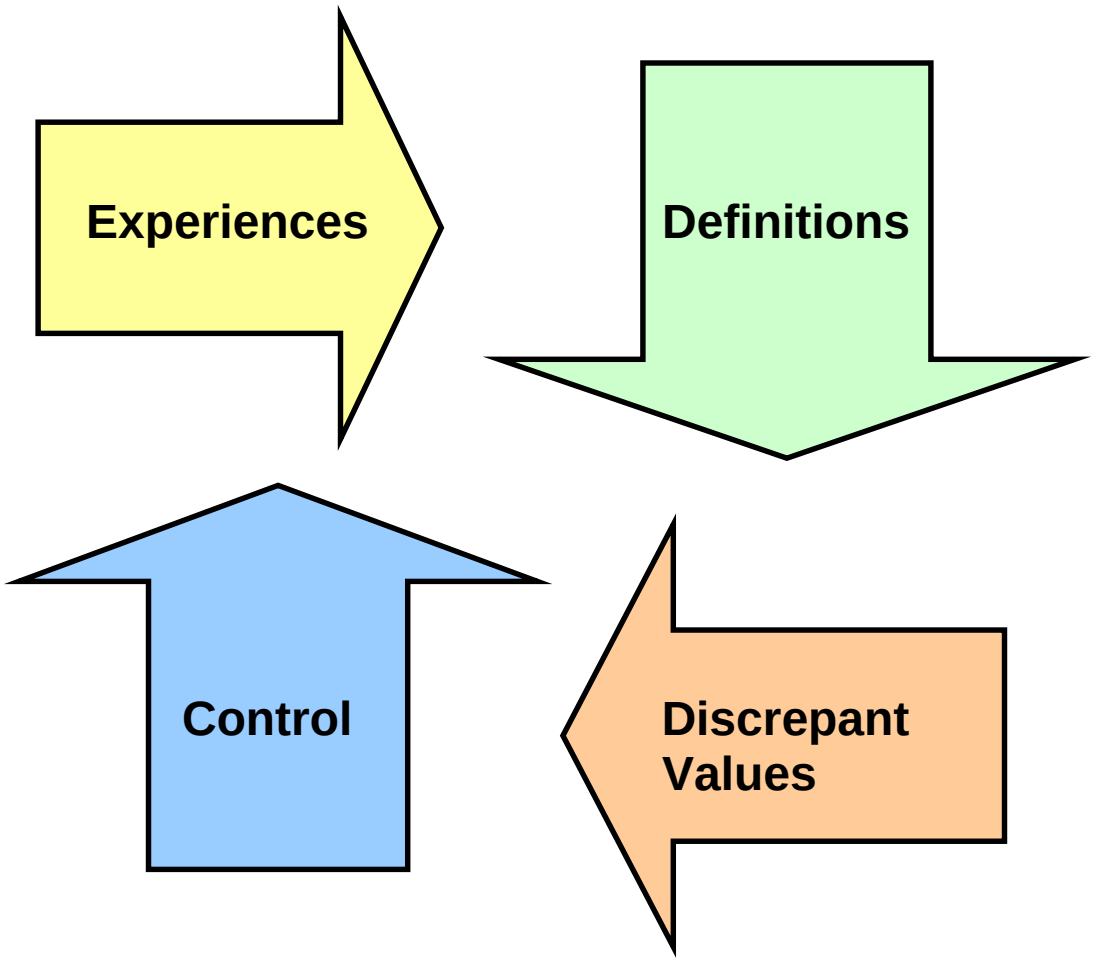

Figure 6. Intervention Model

The Intervention Model begins with Constructs 3 and 4, *Definitions of Training and Development* and *Experience*. Specifically, providing structured learning opportunities to those center staff who are unsure about the benefits of high performance work practices can be an effective way to engage their interest and convince them of the value. Readings, coaching, presentations at NIST and center meetings, reinforced with follow-up materials and conversations, can convey the value of the high performance to center staff. Providing center staff with examples of informal, nonformal and formal learning reinforces these learners' understanding of the value of training and, in turn, enables them to think far more broadly about the variety of training opportunities they can recommend for the clients.

Strengthening these two constructs will, in turn, narrow the contradictions that exist between *Discrepant Values and Behaviors*. Discovering that what we say we do and what we actually do is disparate is not new. Easily observable in other people's behaviors, discrepancies are typically invisible in our own. With regard to human resource management practices in both large and small companies, Deshpande and Golhar (1994) observed "...what is perceived as important by managers may not actually be practiced by them" (p. 55). However, Center Two, especially, demonstrated a tight alignment between the two. Strengthening the *Experience* and *Definitions of Training and Development* continua will have a positive effect on the *Discrepant Values and Behaviors.*

A change in *Control* is the most difficult to effect, because it is highly dependent upon personality. However, continual, consistent and strong exposure to the other three constructs will have an effect on *Control* to the extent that threats to authority will be assuaged by understanding the value of high performance. Sharing power is anathema to many managers. Helping them to understand the value in sharing power to enable accomplishment that will benefit everyone is challenging. But at that point the innovation of high performance will be well on its way toward diffusion.

The four constructs, the Connectivity Circle, and the Intervention Model provide new ways to develop and implement training interventions in an organization. Building the findings from this study into an organization's strategic plan (that includes a strong human resources component) will enhance employees' training and other flexible work practice opportunities. The ultimate result will be a move toward high performance.

With its new MEP Criteria for Center Performance Excellence, based on the seven categories of the Malcolm Baldrige National Quality Awards, NIST provides new motivation to MEP centers to move towards holistic strategies and actions within their own organizations and in their service delivery to client firms. For the first time, NIST is asking centers to consider the inter-connectivity of all of their operations, as well as to align strategy with operations. The new criteria provide an excellent opportunity for centers to adopt and operationalize high performance work practices. This concept is novel to most centers; in fact, the concept is novel to most organizations.

An additional benefit to the new criteria is that centers are now asked to consider their own people practices. Since centers were not asked about or evaluated upon these practices in the past, training and other flexible work practices were conducted in an *ad hoc* manner. These practices were available in centers only if there was a champion, which, most often, was not the center director. With the new criteria, Category 5, Center Workforce Practices and Work Environment, is as important as the other elements of successful center operations. Chapter 5 asks centers to describe elements of their human resource systems: (1) how they design and manage their organizations to maximize employee effectiveness in pursuing center goals; (2) how their education and training programs support key center goals, including the employees' personal development; and (3) how the center maintains a work environment and work climate that support the well-being, satisfaction and motivation of employees, including career development plans (NIST MEP, 1998, p. 9).

Opportunities for informal and nonformal learning abound, but they are not acknowledged as readily as formal, structured learning. Many people overlook those opportunities to introduce new skills or to reinforce existing skills. Or, more often, they participate without even realizing that a learning event has occurred. The continuum of adult education that includes formal, nonformal and informal learning (Coombs, Prosser and Ahmed, 1973) is not well known outside of the adult education community. If one explains and defines the concept – *formal learning* is education provided by educational institutions; *nonformal learning* is organized educational activity outside the established formal system; and *informal learning* is learning from everyday life experiences – the listener seems to understand. Yet, that same listener does not seem to identify his own opportunities to either provide or receive informal learning opportunities as "training," *per se*. Instead, he continues to define training in the most limited sense of the word, i.e., removing workers from their workplace for a specified amount of time to learn a specified skill. Interventions of the type introduced in the above model enable and foster opportunities for informal learning.

Recommendations for Future Research

This research suggests directions for possible future studies. One could begin with a diffusion of innovations model to identify stages in a process that would facilitate dissemination of a high performance model, specifically, or any learning model, generally. Adult learning is about conveying new information and new behaviors. The diffusion literature, with its developmental phases and its focus on communication and the social process, can contribute to many aspects of adult learning.

Far more needs to be learned about technical workers becoming more adept at and comfortable with the so-called softer skills that are important in most professional and social situations. The move toward high performance necessitates wide ranges of skills. What are the best ways to introduce the "techie" to those enhanced skills? Or should hiring practices be modified? What is the relationship among the four identified constructs?

Similarly, managers who demonstrate behaviors on the "narrow" ends of the continua hinder their organizations' move toward high performance. Studies that identified improved techniques for moving managers toward the broader ends of the continua would contribute significantly to people-centered practices.

These studies need not be limited to technical environments. Bolman and Deal (1991) observed the prevalence of the disparity between spoken theories and actual behaviors in most human behavior. Raising awareness about the existence about the phenomenon and identifying ways to help people to practice better alignment would be a great contribution.

Conclusion

This study identified enablers and barriers that encourage or discourage the provision of holistic technical assistance services to small manufacturers. I was able to identify four constructs, their inter-relationships, and their respective contributions to the tendency to achieve a high performance workplace. The constructs have an interdependent relationship with one another; which I identified as the Connectivity Circle. Each construct contributes and one may overshadow another in either a positive or negative fashion. The finding that the constructs combine in a synergistic manner to create an aggregate tendency towards high performance is significant. The intervention model can facilitate effective comprehensive service delivery that will result in high performance work practices.

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Appendix A:

Data Sampling for Center One

Appendix A: Data Sampling for the Center One Case Study

This appendix contains excerpts taken from Center One's source data. The data are representative of the concept development that resulted in the constructs. The data also demonstrate the ways in which the constructs behaved in Center One.

In the text below, the numbered sections are the source data from the Ethnograph files, reproduced to show the interviewees' responses. I included the questions or comments that preceded the responses in order to place the dialogue in context for readers. The codes are defined in Appendix D, the Code Book.

Appendix A: 1

Field Engineer A provided an extensive description of the changes that Center One was experiencing as it moved from limiting its services to technology transfer to being more inclusive. In his response, Field Engineer A addressed the need for Center One to be more market driven and responsive to their clients, and the consequence of that change for the center's field staff.

```
#-CLIENT SVC #-CNTR TRANS #-CONSULT
SBP:  Oh, significantly different.  And   824  -#
  one of the key things that we found     825   |
  out is that when the charter was        826   |
  established about 2 or 3 years ago, we  827   |
  thought we would take this technical    828   |
  solutions and all of this technical     829   |
  expertise from various centers to the   830   |
  small manufacturers and help them to    831   |
  improve the quality of the products.    832   |
  Or help to cut the costs by improving   833   |
  yield, or make them more automatic      834   |
  machineries, offer them more            835   |
  technology.                             836   |
                                                |
  And … but it so happens that we found   838   |
  that that's not what they're looking    839   |
  for.  Most of the manufacturers say     840   |
  that especially the entrepreneurs and   841   |
  the individual owners are saying that   842   |
  we went into this business because      843   |
  that's what our expertise is. Tat we    844   |
  know how to manufacture this.  We know  845   |
  how to run these machines.  But we      846   |
  need a skilled workforce to support     847   |
  this production and this manufacturing  848   |
```

```
  plant that we have.  We need more       849   |
  networking so we can sell more,         850   |
  because we lost some of the sales       851   |
  because our customers have moved out    852   |
  from New Jersey and they've moved       853   |
  south or they took their plant and      854   |
  went off shore.  So now we have to      855   |
  increase our sales to some others or    856   |
  through some other avenues or some      857   |
  other ways.                             858   |
                                                |
$-HOLISTIC
  So they are looking for more help in    860   |-$
  marketing, sales, international         861   | |
  trading, workforce training,            862   | |
  information technology, and internal    863   | |
  communications or procedures, rather    864   | |
  than real technology.  So I think that  865   | |
  is what we didn't expect or we didn't   866   | |
  knowabout.  So we were not quite        867   | |
  prepared for it, because most of our    868   | |
  current partners are expert in the      869   | |
  field.  They are plastics people,       870   | |
  electronics people, you know, machine   871   | |
  people, food people.  But we are now    872   | |
  building up other resources, where now  873   | |
  we're partnering with our small         874   | |
  business institute to come up with      875   | |
  other solutions.                        876  -#-$
```

Appendix A: 2

Field Engineer A was forthright about the needs of the center's field staff, explaining the limitations of a technical-only field staff. He expressed empathy as he described their shortcomings, but he was also realistic about the center's need to expand the capabilities of their field staff to become more holistic in their approaches with clients.

```
SB: Your existing field staff, as I        89
  understand it, one person has a sales    90
  background.  But the other field staff   91
  are all technical folks like yourself,   92
  right?                                   93

#-FA ATT     #-GOOD FA    #-CNTR ADMIN #-HIRING     #-CNTR TRANS
FE1: That's right.  So that was one of     95  -#
  the big challenge that we had that       96   |
```

when we started looking for field 97 |
staff, because we wanted to provide 98 |
technical support to the small 99 |
manufacturer. Initially, we had a 100 |
...a .. our program was to influence 101 |
the manufacturing productivity, dial 102 |
up new products, improve quality, you 103 |
know, improve yield. So we thought 104 |
all along that our focus should be 105 |
that we need the technical people to 106 |
work with the clients, the small 107 |
manufacturers. 108 |
|
But it so happens that the technical 110 |
people don't have this strong 111 |
communication and interpersonal skills 112 |
and that's where there's a gap and 113 |
they don't have the high ego to go out 114 |
and make those cold calls, to go out 115 |
and set up the appointments. So 116 |
ithappens that they sometimes get very 117 |
frustrated because they need a very 118 |
structured project and program. So 119 |
once they know what they're supposed 120 |
to do, they implement very readily. 121 |
But most of them had some tough times 122 |
and are dealing with initial stage of 123 |
building the relationship. And trying 124 |
to understand this concept of 125 |
manufacturing extension program. 126 -#

Appendix A: 3

Field Engineer B was passionate about the need for providing all staff with information that would allow them to participate in the in decision-making process. Yet, he was knew well small business owners' limitations, especially when they were asked to share information. He identified their unwillingness to share information as a barrier to the typical small business owner from moving toward high performance. The following passages provide insights into the small business owners' reluctance to empower their workers with information, additional training, and other flexible work practices.

```
#-SME ATT    #-CONTROL
FE2:  (Sounding weary.)  When you          606  -#
  empower the workforce and cross train    607   |
  the workforce, that can be threatening   608   |
  to an owner.  The empowerment in         609   |
  itself means that I have enabled this    610   |
  worker to make decisions or give him     611   |
  additional training and he becomes       612   |
  more valuable.  He or she may demand     613   |
  more money or better working             614   |
  conditions.  And with the economy        615   |
  being what it is, that person can go     616   |
  to seek employment elsewhere with the    617   |
  new training.                            618  -#

SB:  Is that another excuse that you       620
  hear?  "Why should I do this when that   621
  person is just going to leave?"          622

#-CONTROL
FE2:  I don't hear that, but I know one    624  -#
  reason that companies don't write        625   |
  procedures down and have things visual   626   |
  for a worker is that they don't want     627   |
  to lose control.  So I still him or      628   |
  her what to do.  That way, I have the    629   |
  knowledge, I have the power.  And so     630   |
  when we have companies create work       631   |
  procedures and work instructions,        632   |
  visual aids that represent an            633   |
  investment in time and writing them      634   |
  down, then you are, in effect, giving    635   |
  away what knowledge and what power I     636   |
  have over my workforce.                  637  -#
```

Appendix A: 4

The Center Director expressed ambivalence about the value of training and employee empowerment throughout his two interviews, although he was always clear about training appearing to be a luxury in a small business environment. Whenever I questioned him about the reasons why he was so convinced empowerment was inappropriate in a small business environment, he took on the persona of the company owner and challenged me about my suggestions for employee education and development. He delivered the following passages, role playing the part of a small manufacturing owner or supervisor:

```
                                          |
And you can argue  til you're blue in   684   |
the face why training is important.     685   |
And training is important.  But the     686   |
bottom line is ... you know what,       687   |
lady?  You know what, buddy?  What do   688   |
you know?  You're out of here in an     689   |
hour.  And you haven't been out in the  690   |
real world.  And you've never run a     691   |
company.  And you don't know what it    692   |
is to have to be there on a Thursday    693   |
and figure out how you're going to      694   |
have to get another $20,000 to make     695   |
payroll on Friday.  And if you ain't    696   |
been there, you don't know.  And then   697   |
somebody wants to sit down and talk     698   |
about empowerment and training?   I     699   |
don't want to empower  em.  Because     700   |
then they're going to ask me            701   |
questions.  And if they're asking me    702   |
questions, then they're not working.    703   |
If they're not working, I'm not making  704   |
money.                                  705  -#
```

Appendix A: 5

SME, the small manufacturing executive, belied all of the admonitions expressed by the Center Director for his own company. Yet, he was empathetic towards his own suppliers and some of his competitors whom he observed had not stayed current with the trend toward effective people practices. He was concerned that they would not be able to survive with the new requirements placed on everyone. I asked him if he could describe the circumstances that would lead a small manufacturer down a different path than his company had chosen. The follow

passages are his response. I edited them in the dissertation text, since he talked at length about the situation.

```
SB:  I see.  How would you advise          968
  another small manufacturer regarding     969
  the kinds of things you spoke of early   970
  in our conversation … teaching people    971
  other jobs, giving people career         972
  opportunities, making sure they're       973
  compensated properly.  How would you     974
  make that sell?                          975

#-HPWO       #-TRNG SMALL #-SME ATT
SME:  Well, it's tough.  I can             977  -#
  appreciate the problem that a lot of     978   |
  manufacturers have.  We deal with a      979   |
  number of local manufacturers and,       980   |
  typically, I guess the profile of the    981   |
  companies that we deal with, say as      982   |
  sub-suppliers of our vendors, we find    983   |
  out they're a small organization,        984   |
  maybe a half dozen to 15 employees.      985   |
  And generally, it's a family type of     986   |
  business.  A guy will start a business   987   |
  30 years ago, when there were a lot of   988   |
  machinists out there.  Guys would get    989   |
  their training and journeyman's          990   |
  papers, work for a couple of years,      991   |
  and then they'd buy a milling machine    992   |
  and a lathe and start a business in      993   |
  their garage.  And they would just       994   |
  grow and grow and grow.  Typically how   995   |
  a small machine job shops have gotten    996   |
  their start.                             997   |
                                                 |
  Nowadays, those fellas who started       999   |
  those businesses 30, 35 years ago are   1000   |
  getting to be 60 years old.  In some    1001   |
  cases, they have maybe a son or a       1002   |
  daughter who's come into the business.  1003   |
  But in a lot of cases, they don't.      1004   |
  Typically, what I think has happned is  1005   |
  that they were all … they probably had  1006   |
  a good run of business, but in a lot    1007   |
  of cases, these small organizations     1008   |
  haven't kept up with things like ISO    1009   |
  or various quality systems of that      1010   |
```

nature that maybe some of the bigger manufacturers are going to be looking for from jobbing shops. So there are some that have, some that haven't.

The ones that haven't have seen their business decline over the years, and find that it's getting tougher and tougher to do business. And in a lot of cases, they're just … they're not going to go into the next generation, simply because the money's notthere, people are just basically working to pay their bills and maybe get a little bit ahead. But they're not … I think they're going to have a tough time implementing all the things they need to implement now. I think it's just a matter of too little, too late for some of these organizations. And I don't know really how they're going to pull it together to do all of these things in terms of training and upgrading systems and equipment. Not so much with equipment, I guess. Most places seem to keep upwith that. But in terms of training and putting in place the facilities to meet things like a CE requirement or an ISO requirement, I don't think most of these small manufacturers are going to be able to do it.

In terms of advising them, I'd suggest that what they do is either make that investment in terms of knowing that over the next five years they're going to have to throw x number of dollars into a program to first of all, market whatever their particularniche is. Really recruit that business and get some aggressive business planning involved as far as putting in quality systems and things of that nature. But it's expensive to do. -#

The Center Director's views about empowering workers were quite negative, based on unsuccessful past experiences. He described himself as being in favor of training, but differentiated empowering workers from training and development. The Center's Director's comments are strong indicators of his reluctance to provide what he considers to be too much information to employees, placing him on the "closed" end of the Control Continuum.

```
SB: This leads to questions about your    432
  own management style.  I know how       433
  important your coaching is to you. And  434
  I'm wondering if there's a connection   435
  between your coaching experience and    436
  the way you manage your staff.          437

#-SPKR BKGRD #-SPKR ATT   #-ATT-TRNG   #-ANTI-EMPOW
CD1: Well, my managing philosophy is      439  -#
  two- fold.  One came out of the Marine  440   |
  Corps, my time in the Marine Corps.     441   |
  The second one is the coaching.  And    442   |
  I've had a lot of formal training. And  443   |
  you make a lot of mistakes, you learn   444   |
  from mistakes.                          445   |
                                                |
  The one thing I've learned is           447   |
  empowerment is ... doesn't work with    448   |
  90% of the people.  People don't want   449   |
  to be empowered, you can't force them   450   |
  to be empowered, and if you over-       451   |
  empower, which I did, you get all       452   |
  kinds of problems.  In one company, I   453   |
  over-empowered, and you just get all    454   |
  kinds of chaos.

SB: You mentioned earlier that            602
  empowerment doesn't work.  Talk a       603
  little more about that.                 604

#-ANTI-EMPOW #-DEVALUING  #-MGMT STYLE #-CONTROL
CD1: Well, I found it didn't work         606  -#
  because ... you need people that are    607   |
  educated, you need people that want to  608   |
  be empowered to do it, and most people  609   |
  don't; most people want to be led. And  610   |
  it's real hard to get people to do      611   |
  that.  And I think that in certain      612   |
  kinds of companies, it's hard to        613   |
  empower people.  You know, that last    614   |
  company I had, which was a forklift     615   |
```

dealership, I mean they just didn't 616 |
want to be empowered. So I think you 617 |
need to have people who are more 618 |
educated, that are thinking more. But 619 |
even there you gotta be careful, 620 |
because empowerment's a dangerous 621 |
tool. Empowerment, it doesn't give 622 |
you a ... a free ride to do what you 623 |
want. It's free reign within a set of 624 |
parameters and structure to get things 625 |
done within a certain time frame. And 626 |
to get it done as a team. 627 -#

Appendix A: 7

Field Engineer A responded to a question about whether or not training and other flexible work practices could be implemented in a small manufacturing environment. He was enthusiastic as he described his observations about the concept. Later, when we had finished the official interview and the tape recorder was turned off, he admitted that some of their client firms were reluctant to introduce these practices into their firms. However, he did not contradict the following observations:

```
SB: In your experience, the attitudes of 1201
  the small manufacturers with regard to 1202
  training their staff and the need for  1203
  training their staff.  For example, a  1204
  company with 75 employees, it's not a  1205
  lot of sales, they're meeting their    1206
  bottom line day after dayafter day and 1207
  they're very focused on that.  When    1208
  you guys come to them and say          1209
  Quickview has shown us that this is an 1210
  area where you can use some help,      1211
  what's the typical response you'll get 1212
  from the small manufacturer?           1213

#-SME ATT
FE1:  You know, it depends on which      1215  -#
  particular industry we are talking to  1216   |
  or the particular company.  But we     1217   |
  have found that all across, especially 1218   |
  the companies that are profitable, who 1219   |
  are very productive, who are very      1220   |
  competitive, who are growing           1221   |
  reasonably well or are keeping their   1222   |
  head above the water in a very tough   1223   |
  competitive situation, the companies   1224   |
  are heavily, heavily involved in       1225   |
  training and upgrading the skill of    1226   |
  their staff.                           1227   |
                                                |
```

Appendix A: 8

After he described his firm's effective people practices, I asked SME if he thought of the company as practicing high performance work practices. He was reluctant to use the term, but his responses indicate that, as an employer, they demonstrate many of the practices attributed to high performance firms.

```
SB:  Well, if it's the kind of            416
  organization where people are           417
  interested in not only themselves, but   418
  are making sure that the company         419
  works, then how's the company going to   420
  work if I don't help?                    421

#-HPWO
SME:  Right.  There is a unique           423  -#
  atmosphere as far as people really are   424   |
  working together.  It's not a union      425   |
  shop.  There's never been any effort     426   |
  to organize.  People have always         427   |
  seemed to feel as though they've been    428   |
  reasonably compensated and treated in    429   |
  a reasonable and professional manner.    430   |
  Again, those 10 or 15 people who are     431   |
  key to the organization have been with   432   |
  the company … in most cases, they've     433   |
  been here almost their entire working    434   |
  career.  They realize that this is       435   |
  just the way we operate.                 436  -#

SB:  It sounds like a nice culture.       438

#-HPWO
SME:  It's worked out real well.  I know  440  -#
  it's a little bit different than a lot   441   |
  of places, perhaps, but we're …          442   |
  Surprisingly enough we've been able to   443   |
  prosper really beyond our                444   |
  expectations.                            445  -#

SB:  Now is there sharing of the          447
  prosperity with the workers?             448

#-SME PPL PR #-HPWO
SME:  Yes, there's a couple of different  450  -#
```

```
  way that that happens.  Of course, in   451   |
  terms of wages, when the company's      452   |
  doing well, we see to it that           453   |
  increases are in keeping with the fact  454   |
  that we're doing better.  We set an     455   |
  average or a base percentage and those  456   |
  employees who are performing above and  457   |
  beyond, in our estimation, receive      458   |
  additional money.                       459   |
                                                |
  We have a bonus program.  There's an    461   |
  annual bonus at the end of the year,    462   |
  which is basically a percentage of the  463   |
  yearly wage.  Again, a base percentage  464   |
  and plus or minus depending on          465   |
  performance.  And there's also a        466   |
  formal employee stock ownership plan    467   |
  hich is non-contributory on the part    468   |
  of the employee.  So as the company     469   |
  becomes more profitable, they are       470   |
  compensated.                            471  -#
```

Appendix A: 9

The Center Director, articulating his ambivalence towards the importance of training, demonstrated his discrepant values and actions with the following exchange:

```
SB: And then do you use that as a cue    1307
  that Sandra, with training, can be a   1308
  good addition to your team?  So what,  1309
  then, if anything, would you provide   1310
  in the way of training?                1311

#-ATT-TRNG   #-VAL V BEHA
CD1: It depends on what it is.  If it's  1313  -#
  an organizational planning thing,      1314   |
  we'll try to find something to help    1315   |
  you with that.  If it's relationship   1316   |
  building kind of stuff, we send them.  1317   |
  All of our field agents have been to   1318   |
  at least two and in some cases three   1319   |
  of the MEP training programs.  So I'm  1320   |
  big on training.  We send them,        1321   |
  because I think it's important.  I     1322   |
  mean, my administrative assistant that 1323   |
  we have has been to a course on Women  1324   |
```

```
  in Management and Managing, she's been 1325   |
  to a conflict one.                     1326   |
                                                |
  So even people who are partners, I     1328   |
  send some of them to training.  We     1329   |
  brought all of our partners to Mod     1330   |
  Forum.  So I'm big on training.        1331   |
                                                |
  But again, would I do this if this was 1333   |
  a private sector company if I had to   1334   |
  turn a profit every day?  Probably     1335   |
  not. Probably not.                     1336  -#

SB: That's an interesting distinction.   1338

#-VAL V BEHA #-ATT-TRNG
CD1: Probably not.  Because I just can't 1340  -#
  have people off the line.  I mean, we  1341   |
  used to want to train service          1342   |
  technicians.  And I knew that every    1343   |
  day I had a service technician out of  1344   |
  the line... The service technicians    1345   |
  were expected to bill 10 hours of      1346   |
  billing a day.  And at 80 bucks an     1347   |
  hour, it's 800 a day.  And my margin   1348   |
  on that was 40 percent.  Every day I   1349   |
  got somebody out of the field, it's    1350   |
  320.                                   1351   |
                                                |
  So let me make sure I understand this? 1353   |
  You want me to take 5 technicians for  1354   |
  5 days and you want to train them at   1355   |
  the factory.  That's 1600 a day times  1356   |
  5.  That's 8,000 dollars of gross      1357   |
  profit you're taking out.  No thank    1358   |
  you.  You know, for one day, a         1359   |
  Saturday, down here.  That's the deal. 1360  -#
```

Appendix A: 10

Field Engineer B held an enlightened view of informal and nonformal adult learning practices, especially for one whose formal background is not education. Following is his response to my question about how he defined education.

```
                                                |
SB:  And how about the setting? How do    409   |
  you see training occurring?  I guess    410   |
  what I'm trying to get at, some people  411   |
```

```
  see it as something that has to happen  412   |
  outside the workplace, some people see  413   |
  it as something that happens at the     414   |
  workplace, and I'm just curious as to   415   |
  what your interpretation is.            416   |
                                                |
FE2:  I see it happening at the work      418   |
  site on the equipment.  I can see it    419   |
  in a classroom.  I can see it being     420   |
  done one-on-one, or I can see it being  421   |
  done in a group setting.  It can be     422   |
  done at a library or on the Internet    423   |
  or looking at visuals, text.  You       424   |
  know, all types of media and formats.   425   |
  I don't think one is best.  I think     426   |
  you have to look at the application or  427   |
  the requirement and decide which is     428   |
  best based on the knowledge and the     429   |
  skills and the environment of the       430   |
  participant or the trainee.             431  -#
```

Appendix A: 11

In the following passage, Field Engineer B demonstrated his understanding of the limitations inherent in empowering one's staff, whether in a large or small organization.

```
                                                |
$-EMPOWERMNT $-CONTROL
  And I make recommendations around       460   |-$
  having people who are doing the         461   | |
  process involved because we do not      462   | |
  come in and tell them what to do.  Our  463   | |
  approach is to train them and empower   464   | |
  them to make the changes themselves.    465   | |
  And that's part of it.  So you,         466   | |
  owneror production manager, must be     467   | |
  willing to accept that when you         468   | |
  empower your employees, you're going    469   | |
  to be giving up a certain amount of     470   | |
  control.                                471  -#-$

SB:  And what do you hear as a response,  473
  initially?                              474

#-SME ATT
FE2:  There's usually questions: How      476  -#
  many people have to be involved?  How   477   |
```

much time is it going to take away 478 |
from production? How can I be assured 479 |
that they're going to do what you say 480 |
they're going to do? It's always the 481 |
objections or the concerns thatI'm 482 |
going to be losing production or 483 |
there's going to be down time for so 484 |
many to make this happen. 485 -#

Appendix B:

Data Sampling for Center Two

Appendix B: Data Sampling for the Center Two Case Study

This appendix contains excerpts taken from Center Two's source data. The data representative of the concept development that resulted in the constructs. The data also demonstrate the ways in which the constructs behaved in Center Two

In the text below, the numbered sections are the source data from the Ethnograph files, reproduced to show the interviewees' responses. I included the questions or comments that preceded the responses in order to place the dialogue in context for readers. The codes are defined in Appendix D, the Code Book.

Appendix B: 1

I asked the Center Two director about the well documented success experienced by the center since she had joined the staff two years ago. Her response reflects her commitment to the transition to high performance. She was able to train her staff to become consultants who understood and implemented high performance practices. To her credit, she was able to provide the training that would eventually effect that transition.

```
SB: So that was September 95.  And I      201
  assume you walked into something a      202
  little bit chaotic.  No director for a  203
  couple of months.                       204

#-CNTR BKGRD
CD2: Yeah, and also a lot of people had   206  -#
  just come on board just before the      207   |
  previous director left.  She decided    208   |
  to go back into manufacturing which, I  209   |
  guess, had always been the plan.  She   210   |
  had worked for the host organization.   211   |
  for four or five years and Iguess it    212   |
  was just time for her.  And so she      213   |
  agreed to take the MEP center through   214   |
  its first year.  And she did that.      215   |
  And she did that well.  She started it  216   |
  up and the first year, in 1995, we      217   |
  probably had 8 FTEs total in the        218   |
  center and we had revenues of about     219   |
  $65,000.  In 1996, we had probably had  220   |
  9 FTEs and we had revenues of $158,000  221   |
  — project revenue.  And in 1997, we     222   |
  had 12 maybe FTEs and our revenue was   223   |
  about $357,000.  And we just finished   224   |
  1998, and we have 14 FTEs and our       225   |
```

```
  revenues were $539 or $5 40.            226  -#

SB: Wow.  That’s impressive.              228

#-LEADERSHIP
CD2: It has been impressive growth and I  230  -#
  really attribute it internally to       231   |
  creating order around what people do.   232   |
  Teaching people how to become           233   |
  consultants, recognizing what the       234   |
  constancy of purpose and the mission    235   |
  is and just exploiting it.
```

Appendix B: 2

The Center Director identified two sets of skills – inside the organization consulting skills and outside the organization consulting skills. In this passage, she describes the two different skills in the context of MEP and her role as a Center Director.

```
          We hire a whole bunch of       238   |
  people who are really good at solving  239   |
  problems in organizations and tell     240   |
  them to solve problems outside of the  241   |
  organization, but have a difficult     242   |
  time helping them understand what that 243   |
  is.  And it’s very, very different.    244   |
$-SKILLS
  It’s a whole different set of skills   245   |-$
  to solve problems within an            246   | |
  organization than it is to solve       247   | |
  problems as an outsider.  And that’s   248   |-$
  what you see in terms of our growth.   249  -#
```

Appendix B: 3

I ascertained the Center Director to be a strong leader in her center. She described herself as a systems thinker. In this passage, she demonstrates her skills as both systems thinker and leader.

```
                                The       429   |
  issue is optimization. The issue is,    430   |
  you know, you don’t get a puzzle --     431   |
  like a picture puzzle – you don’t get   432   |
  a picture puzzle and include a cuple    433   |
  of nail scissors in there so that if    434   |
  you don’t like the way the piece fits,  435   |
  you cut it out so that it fits.  You    436   |
  don’t do that.  There’s a way to        437   |
  optimize what that picture is going to  438   |
  look like.  So it’s not saying that     439   |
  one way is more right or morewrong,     440   |
  it’s just what’s going to optimize all  441   |
  of the other pieces.  So the challenge  442   |
  is not “it’s your way, so you’re the    443   |
  right one today” and now “it’s your     444   |
  way so you’re right today.”  It’s more  445   |
  of how do I take all of this stuff and  446   |
  make one thing out of all of these      447   |
$-SYSTEMS
  different pieces.  An organization is   448   |-$
  an organism, it’s a living breathing    449   | |
  organism.  It is not a collection of    450   | |
  individuals.  It is a collection of     451   | |
  individuals acting together towards     452   | |
  some common aim.  And so it’s those     453   | |
  last couple of wor ds that force        454   | |
  culture and force the glue that holds   455   | |
  the individuals together.               456  -#-$
```

Appendix B: 4

As stated in the dissertation text, skill transfer is a key element of all of Center Two's client engagements. The following excerpts from the Center Director and Field Engineer C indicate their aligned values and behaviors with regard to training and other flexible work practices as well as their comprehensive definitions of training and development.

```
CD2: We typically have done only limited 1137
  HR in general and by and large people  1138
  development or personnel development   1139
  work.  Most of our HR work would be    1140
  considered in training and education.  1141
  We'll be one of the anomalies in your  1142
  definition.                            1143

#-CNTR PRACT #-CLIENT SVC
  A component of every engagement that   1145  -#
  we have is skills transfer, because we 1146   |
  never want to be back in the same      1147   |
  company doing the same project again.  1148   |
  And that's one of the guiding          1149   |
  principles of how we sell a project.   1150   |
  So training for the pure sake of       1151   |
  traning is something unusual for us to 1152   |
  do.  We'll do it if there's nobody     1153   |
  else available, like a community       1154   |
  college or a university or something   1155   |
  like that.  But there's a component in 1156   |
  every engagement so that we never have 1157   |
  to come back again and so that we can  1158   |
  transfer skills.                       1159   |
                                                |

   But it would be more typical for us,  1222   |
  when signing on a project, to say,     1223   |
  "You really need  to look at cellular  1224   |
  manufacturing."  It would be more      1225   |
  typical for us to say that and have as 1226   |
  one of the work plan elements that     1227   |
  we'll train everybody, thanit would be 1228   |
  to say, "You really need to train your 1229   |
  people on how to work in cells."       1230  -#

SB: So the training becomes the means to 1232
  the end, rather than the end in        1233
  itself.                                1234
```

```
#-TRNG DEFIN #-CLIENT SVC #-LEADERSHIP
CD2: Right.  And our reason for that is  1236  -#
  two-fold.  One is we really don't      1237   |
  provide training services for training 1238   |
  sake.  We have partners who do that.   1239   |
  And the second is – and this is my     1240   |
  bias; I don't know if it's anybody     1241   |
  else's bias in the organization, but   1242   |
  it is by default because  I was the    1243   |
  director at the time – I believe       1244   |
  adults learn best by experience.       1245   |
  Experiential learning.  And so if we   1246   |
  can be coaches and mentors to make     1247   |
  sure they get the right experiences,   1248   |
  then they'll learn best.               1249   |
                                                |

#-CNTR TRANS #-INTRNL MKT
FE3:  I think when you try as a          1004  -#
  technical person going into a company  1005   |
  and working with a team of their       1006   |
  people, our goal is if we do a set up  1007   |
  reduction project with a certain       1008   |
  company, we don't want them to call us 1009   |
  in a year and say, "Could you come     1010   |
  back and run that project again?"  We  1011   |
  want to walk out of there and have     1012   |
  given them the tools that they can     1013   |
  carry it on and continue to refine it  1014   |
  themselves.  Instead, we go on to work 1015   |
  on other things with them.  And if     1016   |
  they have questions, certainly they    1017   |
  can call and ask and every once in a   1018   |
  while get a little bit of help.  But   1019   |
  we shouldn't do the same work year     1020   |
  after year after year with the same    1021   |
  company.  They should show growth at   1022   |
  some point.
```

Appendix B: 5

In the following excerpt, Field Engineer C is responding to my question about center's internal commitment to high performance work practices, as evidenced by her center colleagues' discussions on how to improve their service to clients.

SB: I'm fascinated by the differences among the centers in terms of attitudes about these kinds of things. You know, most of the folks come from a very technical background. They don't have your education background, which makes you such a good candidate for this. But you're saying that some of the folks with whom you work are probably your basic engineers and yet they understand this.

#-CNTR TRANS

FE3: Oh yeah. It's interesting to hear them talk. The project people themselves occasionally will meet to work on internal processes related to conducting work. For example, tools and techniques that they want to develop so that they're all using similar things and not recreating something over and over again to cut down on time. So they'll meet together and they'll work on special little projects that they want to implement internally for processes for project people. -#

Appendix B: 6

In response to my follow-up questions to the role of leadership in the move to high performance, Field Engineer C said:

```
#-LEADERSHIP
SB:  Which would be what… the             621  -#
  leadership?                             622   |
                                                |
FE3:  Yes, definitely the leadership.     624   |
                                                |
SB:  Hmm.  It always boils down to        626   |
  leadership, doesn't it?                 627   |
                                                |
FE3:  It sure does.  If you can convince  629   |
  the leadership it's important, usually  630   |
  everyone else will fall in line.        631   |
  Although not always.  There are always  632   |
  a few.  But from everyone I've been     633   |
  putting this ISO training through, for  634   |
  example, or the strategic mapping       635   |
  training, it's all been very accepted   636   |
  because their management thought it     637   |
  was important.                          638  -#
```

Appendix B: 7

The Center Director’s entry as director two years ago was met with enthusiasm initially However, as she became better acquainted with some of her staff, she was able to identify the discrepancy that existed between their espoused values and their actual behaviors. In this excerpt, she shares her observations about what people say they want and what they actually want.

```
SB: And were people resistant initially   402
  or were they so thrilled to have you    403
  come and impose some order?             404

#-VAL V BEHA
CD2: You know, it’s interesting and I     406  -#
  think it’s going to be a similar        407   |
  challenge here.  People outwardly want  408   |
```

```
  order and people outwardly want          409   |
  somebody to come in on the white horse   410   |
  with the silver banner, but when push    411   |
  comes to shove, they want somebody to    412   |
  come in and tell everybody that their    413   |
  way is the correct way.  Not to have     414   |
  somebody come in and put a new process   415   |
  in place.  And so that's a huge          416   |
  challenge.                               417  -#

SB: We're so glad you're here.  You'll     419
  just confirm what I've been doing ...    420

CD2: Yes, that's what I've been telling    422
  them all along! That's right!            423
```

Appendix B: 8

Customer focus is a constant operating principle at Center Two, exemplifying their commitment to constancy of purpose. The transcript indicates their commitment to their customers which drives their actions.

```
SB:  I don't think that's real typical.    863
  You guys yourselves really demonstrate   864
  some real qualities of high              865
  performance.                             866

#-SELF PERC
FE3:  Well, I wouldn't have defined it     868  -#
  that way previously.  We're just so      869   |
  concerned about what's best for our      870   |
  customer.                                871  -#

#-CUST FOCUS
SB:  So you're real customer focused.      873  -#
                                                 |
FE3:  Yes, very, very much so.             875  -#
```

Appendix B: 9

The Center Director is not a professional education. Yet, she has a tacit understanding of adult learning principles which is indicative of a comprehensive definition of training and development.

```
                                                    |
$-PROPENSITY
  People who are assigned to be change    963   |-$
  agents in organizations who aren't      964   | |
  natural change agents feel very put     965   | |
  upon.  "Who's going to support me?  I   966   | |
  keep giving and giving and giving and   967   | |
  giving some more and whoever comes      968   | |
  back and gives back to me?"  Now,       969   | |
  ranted, everybody needs a support       970   | |
  system, but there are certain people    971   | |
  who can't be change agents.  "Well, I   972   | |
  told them once and I wrote them a       973   | |
  memo, so they should get it.  So now    974   | |
  I'm going to have a fire breathing      975   | |
  dragon come out at them every time      976   | |
  they time they do it incorrectly.       977   | |
  Where if you are intuitively            978   | |
  understand how people learn and how     979   | |
  people behave and how people change,    980   | |
  then you recognize how absurd it is to  981   | |
  say, "well, I told them once. And now   982   | |
  they have to do it."                    983  -#-$



#-TRNG DEFIN #-CLIENT SVC #-LEADERSHIP
CD2: Right.  And our reason for that is  1236  -#
  two-fold.  One is we really don't      1237   |
  provide training services for training 1238   |
  sake.  We have partners who do that.   1239   |
  And the second is – and this is my     1240   |
  bias; I don't know if it's anybody     1241   |
  else's bias in the organization, but   1242   |
  it is by default because  I was the    1243   |
  director at the time – I believe       1244   |
  adults learn best by experience.       1245   |
  Experiential learning.  And so if we   1246   |
  can be coaches and mentors to make     1247   |
  sure they get the right experiences,   1248   |
```

```
  then they'll learn best.                1249   |
                                                 |
  Because you can have people sitting in 1251   |
  a classroom and they'll never get it   1252   |
  and they'll never implement it.
```

Appendix B: 10

I asked Field Engineer C how she responded to recalcitrant client firms that are reluctant engage in training and development opportunities. She explained that there were ways to be creative about providing these services, which is indicative of (1) aligned values and behaviors regarding training and other flexible work practices and (2) a comprehensive definition of training and development.

```
                                                      |
#-CREATIVE
SB:  And what about the argument of "I    543  -# |
  can't take people off the line"?        544   | |
                                                | |
FE3:  I've never heard that.              546   | |
                                                | |
SB:  Really.  Interesting. Because I've   548   | |
  heard from some folks that when they    549   | |
  present some kind of training option    550   | |
  it's, "Hey man, I've got payroll to     551   | |
  meet on Friday.  I can't give you       552   | |
  somebody on a Thursday."                553   | |
                                                | |
FE3:  Well, I guess I've heard rumblings  555   | |
  of it.  But there's always ways to get  556   | |
  around it.  You can run two sessions,   557   | |
  you know, one during first shift time   558   | |
  and one during second shift time.  Or   559   | |
  for one instance, we had to do some     560   | |
  documentation training for ISO for one  561   | |
  firm and they couldn't get large        562   | |
  enough blocks of time together, like 8  563   | |
  hours together at a time.  So we broke  564   | |
  it up into afternoon sessions or        565   | |
  morning sessions and they just          566   | |
  flip-flopped.  They set up two groups.  567   | |
   One group came every morning for four  568   | |
  hours.  So it was two sessions in one   569   | |
  day of the same material.               570   | |
                                                | |
```

```
SB:  So you think that as long as you're  572   | |
  creative about it…                      573   | |
                                                | |
FE3:  Yeah, you can find ways to get      575   | |
  around it.  If not, they're probably    576   | |
  at risk to lose the employee if they    577   | |
  don't let them get the training.        578  -#-$
```

Appendix B: 11

Field Engineer C spoke passionately about the lack of value for employees and workforce development evidenced in some firms. In the following passage, she describes how mistaken employers are when they consider training to be an expense rather than a value.

```
SB:  When you say "not as much as you'd   701
  like" in terms of high performance      702
  qualities, what do you think you can    703
  do?                                     704

#-SME ATT
FE3:  I think more than anything,         706  -#
  particularly with the smaller firms –   707   |
  those are usually the ones I come in    708   |
  contact with the most – a few larger    709   |
  firms, but usually those under 100      710   |
  employees – is that they don't really   711   |
  understand how much effect… I mean      712   |
  it's like the 2nd largest cost center   713   |
  within the organization is payroll.     714   |
  That's their people investment.  They   715   |
  don't really understand always that     716   |
  there are ways to reduce certain costs  717   |
  associated with that, make it work      718   |
  better.  Maybe make it work more        719   |
  efficiently and it may be a training    720   |
  issue.  Maybe it's other interventions  721   |
  that are needed.  Maybe it has more to  722   |
  do with the planning activities of the  723   |
  company, not with any individual.  But  724   |
  if they could understand more that      725   |
  some of their largest investment,       726   |
  beside equipment, they're making in     727   |
  their company that they want to make a  728   |
  profit from.  And yet, a lot of them    729   |
```

```
  seem to ignore that.  You know, they    730   |
  think the only cost is payroll and      731   |
  benefits and paying the compensation    732   |
  taxes that they're requiredto by State  733   |
  and Federal governments.  They leave    734   |
  it at just that.  They cut it off and   735   |
  they almost cut their own noses off to  736   |
  spite their faces.  So they tend to     737   |
  lose people that they may otherwise     738   |
  keep if they just looked at how they    739   |
  structured certain option plans.  They  740   |
  may be able to attract or keep          741   |
  employees a little bit longer if they   742   |
  looked at some of those things.         743  -#
```

Appendix B: 12

This passage describes the Center Director's exposure to and training for being an excellent consultant. In addition to explaining the success she exhibited at her center, her comments are testimony to the benefits of nonformal learning in the workplace. She was good learner who was given excellent opportunities to learn.

```
#-SPKR BKGRD
CD2: Yeah, yeah.  And then very early on  378  -#
  in this whole consulting thing, I       379   |
  learned how to be the best.  And so it  380   |
  has been a lot of work, but it's been   381   |
  relatively easy to know what to do      382   |
  next.  Having the time to do it is      383   |
  always a challenge, but knowing what    384   |
  to do next is not.
```

Appendix B: 13

In both of the following passages, the Center Director indicates her comprehension of the ways in which adults learn, as well as her strong leadership skills. By understanding her employees' and clients' strengths and weaknesses, she can better assist them to learn new skills, reinforce those skills they already have, and make wise decisions based on that knowledge.

#-SME ATT
SB: Take that vis a vis the small 985 -#
manufacturer. How do you offer those 986 |
same opportunities to his/her staff? 987 |
They’re the ones who say I’m too small 988 |
and I just can’t take the time to do 989 |
that. 990 -#

#-PROPENSITY #-SME ATT
CD2: Well, I think we also have to look 992 -#
at the characteristics of what makes 993 |
our small business people small 994 |
business people. What makes them very 995 |
effective at being small business 996 |
people. What makes many of them 997 |
effective is the ability to tune out 998 |
therest of the world and only focus on 999 |
one or two things and do them well. So 1000 |
why would we expect people who are 1001 |
extremely good at doing one or two 1002 |
things at the same time well, why 1003 |
would we expect them to be any good at 1004 |
looking at the big picture where the 1005 |
re are hundreds of complexities. I 1006 |
think that’s not a logical leap. 1007 |

Appendix C:

Data Sampling for Center Three

Appendix C: Data Sampling for the Center Two Case Study

This appendix contains excerpts taken from Center Three's source data. The data representative of the concept development that resulted in the constructs. The data also demonstrate the ways in which the constructs behaved in Center Three

In the text below, the numbered sections are the source data from the Ethnograph files, reproduced to show the interviewees' responses. I included the questions or comments that preceded the responses in order to place the dialogue in context for readers. The codes are defined in Appendix D, the Code Book.

Appendix C: 1

The Home Office Administrator explained the ways in which Center Three's hiring standards and procedures have evolved as the center's practice has expanded beyond technology transfer only.

```
SB: I'm sure having local partners just   395
  complicates the formula that much       396
  more, but have you seen a different     397
  kind of person getting hired at the     398
  centers?  Or are they the same kinds    399
  of people that you've expected more     400
  from?                                   401

#-HIRING     #-CNTR TRANS #-GOOD FA
COA: Well, in the early days, a body was  403  -#
  a body.  There was less hiring based    404   |
  on market needs and more hiring based   405   |
  on getting somebody in there because    406   |
  they had a position approved and there  407   |
  was a certain amount of business in     408   |
  their region and we needed a certain    409   |
  number of field engineers to do it.     410   |
  They've always been hired based on      411   |
  those kinds of things.  In the          412   |
  beginning, everybody was an engineer.   413   |
  Not necessarily with a master's         414   |
  degree, but everybody basically had a   415   |
  bachelor's in science in some sort of   416   |
  engineering field.  But what I've seen  417   |
  is that as the core capabilities have   418   |
  expanded to include more general        419   |
  business issues, that, yes, we've       420   |
```

```
  hired people who are not necessarily    421   |
  engineers.  They have wider             422   |
  backgrounds, experiences and            423   |
  education.                              424  -#
```

Appendix C: 2

Center Three's challenge is to engage their technology-oriented field engineers in a wider range of training opportunities to ensure they are offering more holistic services to their client firms. The Home Office Administrator has worked hard to change the training milieu and agenda, but has to continue to find new and different ways to present this kind of material to the field staff.

```
#-SME ATT
COA: I don't something like that really   755  -#
  is known by a lot of firms.             756   |
  Organization communication and          757   |
  performance programs, those are         758   |
  probably all the kind of the lower end  759   |
  of the scale on frequency.  Training    760   |
  and Development and Team Building and   761   |
  those things all go hand in hand with   762   |
  quality improvements.  The warm and     763   |
  fuzzy stuff is not as popular – warm    764   |
  and fuzzy being the loftier concepts    765   |
  -- as opposed to the more basic.        766  -#

SB: Would you make the same statement     768
  about your own field engineers?  That   769
  it's not as popular wit them either?    770

#-FA ATT     #-EMPATHY
COA: Our own field engineers... it's      772  -#
  hard to get them to focus on things     773   |
  that they don't face on a day-to-day    774   |
  basis.  Everyone is so concerned with   775   |
  and is always so focused on – and it's  776   |
  the nature of the business – they're    777   |
  focused on their time and what's        778   |
  demanded on them.  And what we demand   779   |
  of them.  Based on how much they're     780   |
  bringing in depending on how much time  781   |
  they're spending with clients.  It's    782   |
  hard for them to set all that aside     783   |
```

```
  and see past that.  So yes, it's        784   |
  equally hard for them to focus on that  785   |
  as it for their clients.                786  -#
```

Appendix C: 3

I selected Center Three because of their long tenure in the MEP system and their ongoing commitment to staff training. I wanted to ascertain how an established technical system makes the transition to holistic services and, in turn, conveys that message to its client firms. This passage explains that process.

```
SB: You've often said you're a microcosm  527
  of the whole system.  You clearly have  528
  a full range of HR services that you    529
  provide.  So is that new?               530

COA: No, that's evolved through time.     532

SB: Could you talk about that?            534

#-HOLISTIC   #-MRKT DRIVE
COA: Personally, I think it's sort of     536  -#
  reflective of changes in the industry.  537   |
   By changes in the industry, I mean     538   |
  you're a small business and you start   539   |
  to work on your...You bring in          540   |
  somebody to work on your technical      541   |
  issues and they prove themselves in     542   |
  that area.  And then you start to look  543   |
  for them in improvement areas and       544   |
  other areas.  And I think it's only a   545   |
  natural transition to watch it go from  546   |
  technical to what I guess you're        547   |
  calling holistic.  To me, it's a        548   |
  natural progression.                    549  -#
```

Appendix C: 4

I identified systems thinking as a component of high performance work places. The Home Office Administrator corroborated this concept.

```
In our evolution as a national system, 1102   |
we’re just at a point now where’re     1103   |
we’re realizing that everything        1104   |
integrates with everything else.  And, 1105   |
again, I think it’s reflective of      1106   |
individual companies and individual    1107   |
centers. It’s all part of your         1108   |
evolution where you realize that all   1109   |
of those things go together.           1110   |
                                              |
A small company with less than 50      1112   |
employees may clearly recognize that   1113   |
they have a problem with their process 1114   |
flow and that they’re functioning      1115   |
mainly on the fact that they’re not    1116   |
getting their product out on time or   1117   |
there’s a lot of scrap and a lot of    1118   |
ework and it’s costing them a lot of   1119   |
money.  And it’s costing them delays.  1120   |
Bringing in someone like a Center 3 or 1121   |
MEP center that fixes that process     1122   |
flow, that’s taking their focus.  But  1123   |
at the same time, if you’ve done a     1124   |
good job and you’ve made some          1125   |
improvements to the business, then you 1126   |
start to think about what else can     1127   |
this assistance, this Center 3 do for  1128   |
me?  And, you know, we were talking    1129   |
about Charles and Darren in western    1130   |
STATE, they know enough that we offer  1131   |
these full ranges of services          1132   |
so...They may not recognize a people   1133   |
systems problem, but they would know   1134   |
enough that, perhaps, it could be      1135   |
something that they could approach.    1136  -#
```

Appendix C: 5

Some small businesses have mature self-perceptions as they think of themselves moving toward high performance. The most sophisticated firms realize that it is a process of continuous improvement, as described by Center One’s SME. More typically, however, small firms lack a systemic self-perception.

```
SB: Do you think that small companies    1138
  typically recognize that they have     1139
  those needs?                           1140

#-SME ATT    #-SME PPL PR
COA: I'm guessing that it would be a     1142  -#
  fair generalization that the majority  1143   |
  of them don't.  I would say that the   1144   |
  majority of them know that they have   1145   |
  specific problems, but that they don't 1146   |
  know that, Number 1, they know they're 1147   |
  having problem but they don't know     1148   |
  what causes it, and Number 2, they     1149   |
  don't really understand the full       1150   |
  effect of it.  They may not understand 1151   |
  what the solution is.  They may think  1152   |
  they know the solution, but it usually 1153   |
  turns out to be something else.  Which 1154   |
  usually leads to something else.       1155  -#
```

Appendix C: 6

The MEP field staff come from a variety of professional backgrounds and experiences. Nevertheless, they are required to provide a vast array of services to their clients, which, for those field staff whose backgrounds were primarily technical in nature, may require a new cadre of skills.

```
SB: Still, the techie people have to     1835
  understand there's a value for it and  1836
  not just discount it.                  1837

COA: Well, I think it goes across the    1839
  board.  Regardless of whether you're a 1840
  techie person or a holistic person.    1841
  To me, an effective field engineer,    1842
  regardless of the situation,           1843
  regardless of structure, regardless of 1844
  their area of expertise, to be truly   1845
  effective and contribute to the        1846
  organization, they have to be able to  1847
  recognize the potential for every kind 1848
  of existence.                          1849
```

Appendix C: 7

The Home Office Administrator has responsibility for providing the field staff with the skills they need to provide holistic services to their client firms. He is not without sympathy for the field engineers, realizing that their responsibilities may keep them from taking, let alone enjoying, training.

```
                                                  |
SB: It’s exactly what you guys feel          1648 |
  about us.                                  1649 |
                                                  |
COA: Exactly.  You know, time wasted to      1651 |
  come to these two day conference.  If      1652 |
  I do any kind of technical training,       1653 |
  that’s more time away.  Going to the       1654 |
  national conference...They see all         1655 |
  this stuff as completely, completely       1656 |
  unnecessary.                               1657 -#

SB: And diverts them from what they’re       1659
  supposed to be doing.                      1660
```

Appendix C: 8

Two passages are identified with this attribution. The Home Office Administrator is relatively new to the MEP system, coming from a non-manufacturing and non-education background. His grasp of education, training and development concepts is extensive and admirable for having learned “on-the-job,” exemplifying informal and nonformal learning techniques. He also demonstrates an expanded definition of training and development, which includes knowledge management and implies human performance improvement.

```
#-HOLISTIC   #-INNIE      #-EMPATHY    #-HPWO
COA: So, I’m not so sure that, you know, 1679  -#
  I think I have a certain                 1680   |
  responsibility to try to affect their    1681   |
  performance.  I can’t really ever lose   1682   |
  sight of the fact that they’re           1683   |
  providing a service and they’re          1684   |
  providing a value to the final end       1685   |
```

```
  user, who is the small manufacturer.   1686   |
  And when it comes to training and      1687   |
  development, I have to provide equally 1688   |
  valuable and equally effective things  1689   |
  that will help them to improve their   1690   |
  value to the small manufacturer.       1691   |

                                                |
  I guess all that holistic stuff that   1707   |
  has an effect on them that will        1708   |
  hopefully trickle down and have an     1709   |
  effect on the client, I can't really   1710   |
  force feed any of that stuff to them.  1711   |
  My focus now has to be on...I see two  1712   |
  things in the future.  Just basic      1713   |
  creer development stuff and creating   1714   |
  knowledge and managing more of the     1715   |
  information that's specific to each    1716   |
  office and making it easily and        1717   |
  quickly available to the other         1718   |
  offices.  It may not necessarily be    1719   |
  training, but it's getting into the    1720   |
  area of knowledge management.  Human   1721   |
  capital.                               1722  -#
```

Appendix C: 9

This passage exemplifies the ways in which adults can learn. In this case, the center director was influenced by an external catalyst, the new NIST Evaluation Criteria. Regardless, the center director's understanding of the components of his organization expanded to a more systemic, holistic perception.

```
                                                |
$-LEADERSHIP $-ATT-TRNG
COA: I've seen the change as a result of 1586   |-$
  the Baldrige change.  I think it made  1587   | |
  him recognize a couple of things.  I   1588   | |
  think it made him recognize the        1589   | |
  importance of the Center 3             1590   | |
  organization being a little more aware 1591   | |
  of the importance of integrated        1592   | |
  systems and working together.  Center  1593   | |
  3 Corporate is a lot of little islands 1594   | |
  and, again, this may be reflective of  1595   | |
```

the environment that you work in, but 1596 | |
there’s a lot of clear cut territories 1597 | |
in here that don’t necessarily...the 1598 | |
lines don’t necessarily ever get 1599 | |
crossed. Going through the review 1600 | |
process that we did, each of us who 1601 | |
are responsible for our own little 1602 | |
territories were responsible for 1603 | |
putting that review together as a 1604 | |
team. And we learned a lot about each 1605 | |
other that way. And Center 3 Director 1606 | |
learned a lot about all of us. 1607 -#-$

Appendix D:

Code Book

HIGHPERF:Code Book--All Code Words 3/27/1999 7:11:08 PM

Code Word	Parent	Text	Level	Added	Modified
ACCOUNTABI	MGMT STYLE	Yes	2	03/21/99	03/22/99
	Refers to responsibility felt or reported for actions or behaviors of self, employees and organization.				
ALIGNMENT	None	Yes	1	03/20/99	03/22/99
	Personal or organizational references. In the construct, refers to consistent values and behaviors. Also implies that the elements of a system are complementary.				
ANTI-EMPOW	CONTROL	Yes	3	03/20/99	03/22/99
	Questions the value of empowering staff with information, decision-making authority, or autonomy.				
ATT-TRNG	INNIE	Yes	3	03/20/99	03/22/99
	Center director's attitude towards training; accepts or rejects the value of training when it comes to his/her own staff.				
BIG V SMAL	CNTR ADMIN	Yes	2	03/20/99	03/22/99
	Techniques, tools, policies, procedures that work in large companies may be inappropriate for small companies.				
BIZ MODEL	CLIENT SVC	Yes	3	03/20/99	03/22/99
	Structured approach to working with SMEs.				
BRD NAIVE	CNTR ADMIN	Yes	2	03/20/99	03/22/99
	Board's failure to understand all aspects of the MEP Center; tendency to be too tactical, rather than strategic.				

HIGHPERF:Code Book--All Code Words 3/27/1999 7:11:08 PM

Code Word	Parent	Text	Level	Added	Modified
BRD-DIRS	CNTR ADMIN	Yes	2	03/20/99	03/22/99
	Backgrounds, attitudes, responsibilities of Center board.				
BROKER	CNTR ADMIN	Yes	2	03/20/99	03/22/99
	MEP center model in which the center works with partners to sell the partners' services. The center retains project management fees.				
CENTRALIZ	MGMT STYLE	Yes	2	03/21/99	03/22/99
	Center institutes policies, procedures, etc. for all field office staff. Especially significant in centers with multiple offices.				
CH SME ATT	SME ATT	Yes	2	03/20/99	03/22/99
	Evolution of SME's attitudes, as demonstrated by their behaviors, toward training and other flexible work practices.				
CHALLENGES	ATT-TRNG		4	03/22/99	00/00/00
	The difficulties faced with hiring and training competent staff.				
CHANGE	LEADERSHIP	Yes	3	03/20/99	03/22/99
	It is difficult to change people. "I will remain the same until the pain of remaining the same is greater than the pain of change".				
CLIENT SVC	CNTR ADMIN	Yes	2	03/20/99	03/22/99
	Procedures, policies, center operations that are in place to serve SME customers.				

HIGHPERF:Code Book--All Code Words 3/27/1999 7:11:08 PM

Code Word	Parent	Text	Level	Added	Modified
CNTR ADMIN	None	Yes	1	03/20/99	03/22/99
	Describes centers' operations, including personnel policies, board involvement, field staff roles and responsibilities.				
CNTR BKGRD	CNTR ADMIN	Yes	2	03/20/99	03/22/99
	Age, philosophy, evolution of the center.				
CNTR HIRE	CNTR ADMIN	Yes	2	03/20/99	03/22/99
	Hiring policies of the center with regard to field engineers' backgrounds.				
CNTR PRACT	CNTR ADMIN	Yes	2	03/20/99	03/22/99
	Types of services provided to SMEs by MEP centers. Ranges from technical orientation to holistic.				
CNTR TRANS	CNTR ADMIN	Yes	2	03/20/99	03/22/99
	Center's internal evolution from technology transfer to more holistic approach; includes continuous improvement loops.				
CNTR TRNG	CNTR ADMIN	Yes	2	03/20/99	03/22/99
	Training services provided by MEP centers to their SME clients.				
CNTR VALUE	CNTR ADMIN	Yes	2	03/20/99	03/22/99
	Refers to the value that SMEs attribute to MEP centers' services to them.				
CONDS-TRG	None		1	03/22/99	00/00/00
	The time, place, and circumstances when training will work.				

Code Word	Parent	Text	Level	Added	Modified
CONSENSUS	MGMT STYLE	Yes	2	03/20/99	03/22/99
	Organizational decisions are made when all of the stakeholders are in agreement with the decision to be made. Connotes inclusiveness.				
CONSULT	CNTR ADMIN	Yes	2	03/20/99	03/22/99
	Refers to knowledge, skills and abilities acquired by field agents as they broaden the service delivery they can offer their client firms.				
CONTROL	MGMT STYLE	Yes	2	03/20/99	03/22/99
	Premium placed on maintaining superiority over others' access to information and autonomy.				
CORE COMPS	CNTR ADMIN	Yes	2	03/21/99	03/22/99
	Basic group of skills that an organization requires for all stakeholders. Indicates cadre of services provided by the MEP center.				
CREATIVE	CNTR PRACT	Yes	3	03/20/99	03/22/99
	Refers to non-traditional techniques for engaging SMEs in training and other flexible work practices.				
CUST FOCUS	MGMT STYLE	Yes	2	03/20/99	03/22/99
	Listening to the "voice of the customer"in delivery of services to SMEs.				
DECENTALIZ	MGMT STYLE	Yes	2	03/21/99	03/22/99
	Center allows field offices to make some/most of their decisions independent of the central office. Connotes less control.				
DEVALUING	MGMT STYLE	Yes	2	03/20/99	03/22/99
	Demonstrates superior attitude towards underlings, supervisors, stakeholders.				

HIGHPERF:Code Book--All Code Words 3/27/1999 7:11:08 PM

Code Word	Parent	Text	Level	Added	Modified
EMPATHY	FA ATT	Yes	2	03/21/99	03/22/99
	Understands concerns that the SME brings vis a vis training and other flexible work practices; understands limitations of some of the SME staff.				
EMPOWERMNT	MGMT STYLE	Yes	2	03/20/99	03/22/99
	Provide staff with opportunities for training and other learning opportunities, many of which are provided in informal contexts, to enable staff to become more engaged and participative in the organization's short and long term goals.				
EXP. TRNG	ATT-TRNG	Yes	4	03/20/99	03/22/99
	The prior experiences people had influence their willingness to introduce or maintain training in their current situation.				
FA ATT	None	Yes	1	03/21/99	03/22/99
	Skills possessed by field agents who can be responsive to client needs. Typically includes range of technical skills combined with business processes. If FA doesn't have latter skills him/herself, knows where referrals should be made.				
FLEX W/P	HP PRACTIC	Yes	3	03/20/99	03/22/99
	Includes cross training, pay for performance, shared decision making, and, generally, open style of management. In this study, suggests results will be increased productivity and success for the firm.				
FUTURE W/F	WRKR SHORT	Yes	2	03/20/99	03/22/99
	Issues surrounding training and hiring inchoate workers in small manufacturers. Includes school-to-work.				

Code Word	Parent	Text	Level	Added	Modified
GOOD FA	CNTR TRANS	Yes	3	03/21/99	03/22/99
	Skills possessed by field agents who can be responsive to client needs. Typically includes range of technical skills combined with business processes. If FA doesn't have latter skills him/herself, knows where referrrals should be made.				
HIRING	MGMT STYLE	Yes	2	03/20/99	03/22/99
	Tools, techniques, attitudes re. hiring new staff.				
HOLISTIC	HPWO	Yes	2	03/20/99	03/22/99
	Services range from traditional technology transfer to include other business services, including training, workforce development, strategic planning, etc.				
HP PRACTIC	HPWO	Yes	2	03/20/99	03/22/99
	Applies to centers or to SMEs. Indicates organization's commitment to high performance.				
HPWO	None	Yes	1	03/20/99	03/22/99
	Center or SME that consistently demonstrates HP practices, including training, flexible work practices, shared decision-making, etc.				
HUMAN ACT	MGMT STYLE	Yes	2	03/20/99	03/22/99
	Systemic way of introducing change in an organization, based on inputs.				
INF. TRNG	None	Yes	1	03/20/99	03/22/99
	Mentoring, coaching, exposure to new concepts, on-the-line sharing of new KSAs.				

HIGHPERF:Code Book--All Code Words 3/27/1999 7:11:08 PM

Code Word	Parent	Text	Level	Added	Modified
INNIE	CNTR ADMIN	Yes	2	03/20/99	03/22/99
	Training activities that are focused inwardly (on center staff). Includes skill development, e.g., sales training, proposal writing, as well as exposure to HP concepts.				
INTRNL MKT	CNTR ADMIN	Yes	2	03/20/99	03/22/99
	Internally marketing concepts to the field engineers, based on knowledge of their strengths and weaknesses.				
LEADERSHIP	MGMT STYLE	Yes	2	03/20/99	03/22/99
	Leader's role in leading the group towards high performance.				
MARKETING	TRANS HP	Yes	3	03/20/99	03/22/99
	Selling MEP services to SMEs, helping them to understand the need for an organization like the MEP.				
MGMT STYLE	None	Yes	1	03/20/99	03/22/99
	Ways in which manager treats employees, willingness to integrate training and other flexible work practices, etc.				
MGMT TECH	MGMT STYLE	Yes	2	03/20/99	03/22/99
	Tools used to implement or maintain mgmt practices in the organization.				
MISMATCH	CNTR ADMIN	Yes	2	03/20/99	03/22/99
	Field Agents' skills are out of sync with services required by market. May be addressed with training.				

Code Word	Parent	Text	Level	Added	Modified
MRKT DRIVE	CNTR ADMIN	Yes	2	03/21/99	03/22/99
	MEP center provides services to clients based on the clients' needs, not just the center's needs for revenue generation.				
NEW BIZ	CNTR ADMIN	Yes	2	03/20/99	03/22/99
	Centers must continually concern themselves with expanding their client base as well as generating repeat business with old clients.				
NIST TRNG	None	Yes	1	03/20/99	03/22/99
	NIST-sponsored training, offered to all MEP centers. To date, no NIST training is mandatory, although it may be highly recommended.				
OPTIMIZE	MGMT STYLE	Yes	2	03/20/99	03/22/99
	Management that ensures that the best of circumstances are realized. Structures use of staff's best abilities, in combination with organizational support.				
OUTIE	CNTR ADMIN	Yes	2	03/20/99	03/22/99
	Training activities are focused outwardly (on client firms) Partners - Other organizations that provide services in conjunction with the center. Typically, the goal is to ensure that there is no redundancy among partnering organizations, especially when the charter specifies the partnering organization has specific responsibilities that the center cannot perform. Also includes pay structure for private sector partners.				
PARTNERS	CNTR ADMIN	Yes	2	03/20/99	03/22/99
	Organizations with which the center has a formal or informal working relationship.				

Code Word	Parent	Text	Level	Added	Modified
POL-SAVVY	MGMT STYLE	Yes	2	03/20/99	03/22/99
	Knows the way the system works; able to call the appropriate people for appropriate tasks; courts the necessary support; understands subtleties of process.				
PROPENSITY	None	Yes	1	03/20/99	03/22/99
	Tendencies towards certain kinds of behavior; has become tacit.				
PUB V PRIV	CNTR ADMIN	Yes	2	03/20/99	03/22/99
	Describes the conflict that may exist between the MEP centers as public institutions versus their preferences to administer themselves as though they were private organizations. Conflicts may arise between the two different cultures.				
ROLE FE	CNTR ADMIN	Yes	2	03/20/99	03/22/99
	The role that the Field Engineer may play with regard to offering services to client firms.				
SELF PERC	VAL V BEHA	Yes	2	03/20/99	03/22/99
	The ways in which interviewees see themselves vis a vis their attitudes about training and other HR policies.				
SKILLS	TRANS HP	Yes	3	03/20/99	03/22/99
	Abilities exhibited by field staff as they work with their SME clients. Connotes abilities to provide holistic services.				
SME ATT	None	Yes	1	03/20/99	03/22/99
	The value of training and other flexible work practices as seen through the eyes of the SME. Readiness is a factor, as is complacency.				

Code Word	Parent	Text	Level	Added	Modified
SME BKGRND	SME OWNER	Yes	2	03/20/99	03/22/99
	Age, philosophy, history of the SME.				
SME OWNER	None	Yes	1	03/20/99	03/22/99
	Culture, procedures, operations that are unique to small businesses, primarily because of owner's experiences, preferences, and attitudes.				
SME PPL PR	None	Yes	1	03/20/99	03/22/99
	Includes hiring, compensation, retention practices of small businesses.				
SPKR ATT	None	Yes	1	03/20/99	03/22/99
	Attitude speaker conveys re. his staff, his board, his customers, NIST, e.g., superior, "in-charge," open, coach. With Center Directors, it suggests style of management.				
SPKR BKGRD	SPKR ATT	YES	2	03/20/99	03/22/99
	Speaker's education, interests, strengths, work history prior to joining the center.				
STAFF TRNG	CNTR ADMIN	Yes	2	03/20/99	03/22/99
	Training that is provided by the center director for the MEP staff. Can be provided by internal MEP center staff or by an outside vendor.				
STANDARDIZ	CNTR ADMIN	Yes	2	03/20/99	03/22/99
	Need for unified ways in which training and other processes are presented to clients and within centers.				

Code Word	Parent	Text	Level	Added	Modified
STATEFUNDS	None	Yes	1	03/20/99	03/22/99
	Funding available through the state for employers to use to train their employees. Usually requires an application process, with which MEP center can assist.				
SYSTEMS	HPWO	Yes	2	03/20/99	03/22/99
	Understanding the organization as a system, where various elements of the organization affect one another. Implies that if something happens in one area, there will be an effect in another.				
TEAMS	MGMT STYLE	Yes	2	03/20/99	03/22/99
	Benefits to grouping people to accomplish specific tasks. Builds on everyone's strengths.				
TRAD W/P	MGMT STYLE	Yes	2	03/20/99	03/22/99
	On the "closed" end of the control continuum, connotes management that is unlikely to include employees in decision making, limits training opportunities, and centralizes all power and authority to higher level managers.				
TRANS HP	CNTR ADMIN	Yes	2	03/20/99	03/22/99
	Ways to work with centers to assist them to achieve HP work practices.				
TRNG DEFIN	None	Yes	1	03/20/99	03/22/99
	Ways in which interviewees described training. Ranged from traditional, formal view to understanding of importance of informal leanring methods.				
TRNG SKILL	CONDS-TRG		2	03/22/99	00/00/00
	Providing training opportunities for staff.				

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Code Word	Parent	Text	Level	Added	Modified
TRNG SMALL	ATT-TRNG	Yes	4	03/20/99	03/22/99
	Opportunities to provide training in small businesses.				
VAL V BEHA	None	Yes	1	03/20/99	03/22/99
	Contradictory relationship between a spoken value or theory and the ways in which that value or theory is enacted. Led to construct "discrepant values and behaviors.				
WRKR SHORT	None	Yes	1	03/20/99	03/22/99
	Refers to the inadequate numbers of inchoate workers in manufacturing industries. Drives HR practices within SMEs that are thoughtful about these issues.				

VITA

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Graduated from the University of Illinois, Urbana, Illinois, with a B.S. degree in Elementary Education in 1967, followed by an M.Ed. degree in Elementary Education (with a speciality in reading) in 1968. Earned special education certification from Northwestern University in Evanston, Illinois, in 1971.

Taught regular classroom and special education in elementary and secondary schools in the Chicago suburban area from 1968 - 1978. Worked as an educational specialist in special education for the Illinois State Board of Education, in Springfield, Illinois, from 1979 - 1981, and for the Mid-Atlantic Regional Resource Center, in Washington, D.C., from 1981 - 1982.

Worked in the private sector as an office and personnel administrator at The Rouse Company's Washington, D.C. project and with General Health, Inc., from 1983 - 1987. Earned an administrative certificate from The George Washington University.

Combined public and private sector experiences at the National Alliance of Business in Washington, D.C., from 1987 - 1996. Managed projects and developed materials pertaining to business-education partnerships, school-to-work transition, workforce development, quality, and other educational reform issues that engaged business involvement.

Joined, in 1996, the National Institute of Standards and Technology Manufacturing Extension Partnership (NIST MEP) program in Gaithersburg, Maryland, as a senior technical advisor in the People Systems program area. Develop products, manage projects, and provide human resource and training technical assistance to MEP center staff. This study was based on data gathered from the MEP system.

Studied for the Ph.D. degree at Virginia Polytechnic Institute and State University's Northern Virginia Graduate Center from January 1994 to April 1999. Completed doctoral dissertation and earned Ph.D. degree in April 1999.