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Stakeholder Variation in Perceptions About Training Program Evaluation

by

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Abstract

This study explores perceptual variation among stakeholder groups regarding their views of training results and evaluation in a complex organization. The case setting for the study was chosen in part based on its collective intellectual capital of knowledge workers. Rather than focus on the evaluation of a singular instructional intervention based on the perceptions of a singular stakeholder group, the current study considers the perceptions of three distinct stakeholder groups, namely training participants, training providers, and training sponsors, in terms of their perceptions relative to an entire program (consisting of multiple course interventions). A conceptual framework was developed to accommodate complex organizational contextual elements especially in terms of effectiveness, multiple-constituency group perceptions, knowledge work, and organizational learning. Multiple methods were used in three phases of research to analyze perceptual variation across the stakeholder groups. These methods included the use of concept mapping and pattern matching (phase 1), semistructured interviews (phase 2), and a survey instrument using quantitative techniques (phase 3). The integrated results of the study support that stakeholder group views of training evaluation do correspond with and depend on their perceptions of training results. While all groups perceived a similar set of training results as beneficial to the organization, each group emphasized different aspects of these results in terms of training evaluation. These differences were found to correspond with the specific organizational role of each group. Implications of the findings are developed and discussed. Several recommendations to improve training evaluation theory and practice are presented with the main findings of the study.

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According to Marshall McLuhan "Where the whole man is involved there is no work...Work begins with the division of labor" (Understanding Media, 1964). While many a doctoral student (myself included) has probably felt at times as if they were on their own, I strongly suspect that no such student believed this to be truly the case. No dissertation would ever be completed without the collective efforts of many dedicated people. It is here that I will attempt to convey my sincere thanks and appreciation to those who have collaborated with me to produce this dissertation.

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Chapter 1

Introduction

Statement of the Problem

According to a recent Conference Board research report on the value of training in the era of intellectual capital[1], "Little has been done up to the present time to evaluate systematically the results of complete company training programs" (Conference Board, Inc., 1997, p. 7). The current thesis connects this problem to the dearth of research on variation among key stakeholder groups especially in terms of their perceptions of the results and evaluation of training programs. In particular, current training evaluation practice is seen to be limited by a lack of empirical understanding of how key stakeholder groups vary in their perceptions of training results and how these perceptions affect those related to training evaluation. This limitation is particularly acute in the context of complex, knowledge-based organizations of multiple actors and multiple goals.

Although they continue to serve as useful heuristics, most training evaluation models fail to account for multiple group perspectives. Rather, they exploit assumptions grounded largely in classical organizational theory about the means, ends, costs, and benefits of training. Such models are further laden with untested assumptions regarding the purposes, processes, and consequences of training evaluation especially from a multiple-constituency perspective. A subsidiary problem is a clear lack of integration among related domains involving organizational, evaluation, and training evaluation

[1] Stewart (1999) defines intellectual capital simply as the sum of everything everybody in a company knows that gives it a competitive edge.

studies. For example, the application of organizational effectiveness and power theory (well recognized in organizational studies and general program evaluation) is generally ignored in current training evaluation models and rarely discussed in connection with training evaluation.

A widely recognized training evaluation model that has been influential over the past 40 years was described by Kirkpatrick (1959, 1975, 1994, 1996). As a four-level taxonomy this model describes level four training evaluation specifically in terms of results in the organization or business. This implies a singular perspective and even general agreement about the nature and causality of such results. There is little evidence to support the existence of such agreement (Gill, 1989; McDonald, 1987; McLinden, 1995; McLinden & Trochim, 1998). By seeking to provide proof of training results the model (and the many successors that it has influenced) further limits definitions of such results to those generally assumed to be well-recognized by management as the main (or only) legitimate stakeholder group. Because management generally has program funding and budget power for training, evaluation is done mostly in terms of traditional, economic indicators related to, for example, changes in production, scrap, defects, and the like (see, e.g., Rae, 1986). The over reliance on such traditional indicators, however, limits both the meaningfulness and potential usefulness of training evaluation. It ignores the values and perspectives of multiple stakeholder groups (beyond management) as potential users of evaluation findings and represses consensus on both the nature of training results and the causality for such results (Brown, 1994).

Beyond these traditional indicators, however, alternatives can be conceptualized in terms of training's multiple and emerging roles in learning organizations of knowledge

workers.[2] Of particular interest are those results perceived by knowledge workers as a stakeholder group that has been increasingly discussed in terms of its organizational importance. Specific aspects of the emerging importance of this group have been described in terms of knowledge worker productivity (Caplan, 1995; Drucker, 1993a; Stone & Villachica, 1997), job definition and employee satisfaction (Schein, 1993; Bridges, 1994), and organizational learning (Dixon, 1992; Huber, 1991, Pedler, Burgoyne, & Boydell, 1991; Pinchot & Pinchot, 1993).

Ironically, because measuring training's economic worth is both difficult and requires substantial organizational resources, training evaluation practice continues to focus largely on trainee satisfaction in terms of single training (course) events (Bassi, Benson, & Cheney, 1996; Brandenburg, 1989; Erickson, 1992; Gordon, 1992a; Wynne & Clutterbuck, 1991). Yet this practice ignores training's net results as an integrated program containing multiple interventions acting in concert to achieve a combined increase in organizational knowledge and skills (Brinkerhoff & Gill, 1994). As such opportunities to improve organizational performance through the use of a system-level program evaluation approach continue to be displaced by efforts to "prove" the value of individual training interventions (courses) as independent events. In many cases, training professionals, internal to both the organization and the program, end up planning, executing, and reporting evaluation results.

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[2] Peter Drucker originally coined the term "knowledge worker" circa 1960 to refer to educated professionals with high expertise and specialized organizational roles see, e.g., Drucker, 1993a, 1993b.

The process of training evaluation necessarily involves multiple values and perspectives. In addition to knowledge workers (employees) who participate in training as learners, two other obvious groups include management, and the training professionals who provide, develop, or facilitate training. According to McLinden and Trochim (1998, p. 21):

> An assessment of value starts with the question: "What outcomes do we expect from this program?" This sounds like a straightforward task—simply name the expectations. But whose expectations? Typically, training programs have multiple stakeholders who maintain different beliefs about program impact.

But as noted perceptual variation among multiple training stakeholder groups has not been investigated rigorously. A central objective for the present research was to address this gap by investigating this variation especially in terms of its implications for systematic training program evaluation. The two research questions posed to drive the investigation are simple in their statement yet powerful in their implications. These are presented next.

Research Questions

The primary motivation for the study was to add to our limited knowledge of stakeholder variation in training program evaluation particularly in a complex organization of knowledge workers. The conceptual framework presented and discussed at the end of the next chapter draws upon theoretical and empirical work related to training and program evaluation as well as organizational studies to frame and situate the research. The following research questions serve to focus the study.

Question One

The first research question focuses on identifying variation in stakeholder group views of training program results:

To what extent do training stakeholder groups differ in their perceptions of training results and the relative importance of such? What are the key dimensions of divergence?

Three commonly identified[3] training stakeholder groups include (1) training program *sponsors*, (2) training *participants* or trainees, and (3) training program *providers*. Each group can be predicted to perceive training results in terms of two broad categories labeled as traditional and emergent indicators of effectiveness as shown in **Table 1**.

Table 1. Predicted Stakeholder Relationships for Training Results and Importance

	Perceived Importance by Stakeholder Group		
Training Results	Sponsors	Participants (trainees)	Providers
Traditional Indicators (e.g., financial: profitability, productivity, ROI; efficiency, organizational growth)	high	moderate to low	high
Emergent Indicators (e.g., employee and customer satisfaction, professional and career growth, organizational learning)	moderate to low	high (mostly career and professional growth, job satisfaction)	moderate to high

Traditional indicators of training results include quantitative, largely financial, measures such as profitability, productivity, and return on investment (ROI). These also include associated indicators related to efficiency and organizational growth. Although rooted in the classical organizational theory of the past century such traditional thinking continues to pervade contemporary organizational thought and action. Related to such

traditional indicators, Drucker (1995) described the accounting model as "ossified in every joint and tissue" of organizations (p. x). Also, as presented in the (following) literature review chapter, a substantial body of training evaluation literature continues to promote training evaluation in terms of such traditional measures.

Emergent indicators of training results are based on a steadily developing body of knowledge that focuses on people—especially knowledge workers—as the main source of organizational success and competitiveness (Conference Board, Inc., 1997; Pfeffer, 1994; Pinchot & Pinchot, 1993). These involve a generally more qualitative set of measures concerned with the growth and satisfaction of individuals as well as learning at the organization-level. The management and training evaluation literature reviewed demonstrates an evolving body of knowledge recognizing such emergent indicators.

While not shown in Table 1, a key assumption of the predictions is that each stakeholder group will view both the relative importance of each training result and its importance in terms of training program evaluation in a concordant manner. That is, for each training result perceived by the group to be high in relative importance it is expected that the group will also rate this (same result) to be similarly high in relative importance for purposes of training program evaluation. This assumption is tested in research phase 1. The second research question focuses on stakeholder views of evaluation.

Question Two

As outlined in the literature review chapter there are many possible approaches to program evaluation. In addition to issues associated with perceived training results the question arises about whether stakeholders vary in favoring particular evaluation

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[3] See, e.g., Broad and Newstrom (1992).

approaches especially in relation to their perceptions of training results. This leads to the second research question which deals specifically with stakeholder views of training program evaluation:

Do stakeholder views about training evaluation depend on the training results they perceive? If so, in what ways?

In relation to the previous question and set of predicted relationships it is possible to form predictions for stakeholder perceptions in terms of the purposes, processes, and consequences of evaluation as depicted in **Table 2**.

Table 2. Predicted Stakeholder Relationships for Training Program Evaluation

	Evaluation Emphasis by Stakeholder Group		
Training Program Evaluation	Sponsors	Participants (trainees)	Providers
Purposes	summative	formative	formative/summative
Processes	quantitative data collection and objective analysis	qualitative data based on individual perceptions of benefit	quantitative and qualitative data; customer responsive
Consequences	use for operational and program funding decision making	program improvement to meet needs of professional growth	same as both previous and to demonstrate program worth

Stakeholder views related to training program evaluation are categorized in terms of the purposes, processes, and consequences of evaluation. Program evaluation purposes are conceptualized in terms of formative and summative intentions. The basic question of formative evaluation is "How can the program be improved?" Alternatively, summative evaluation asks, "Should the program be continued? If so, at what level? What is the overall merit and worth of the program?" Program evaluation processes involve the planning and execution of the evaluation. This includes basic considerations of who participates, and how they participate as well as the delineation of details related to the type, amount, and quality of data involved. Program evaluation consequences

include specifics of how the results of the evaluation are utilized. This includes considerations of who uses the results and to what ends.

Using the types and characteristics of organizational power described by Mintzberg (1983), each stakeholder group can be further predicted to express particular views about evaluation. For example, reinforcing the system of authority concerned with control and accountability, program sponsors might be expected to emphasize summative evaluation. The process to accomplish this might be expected to involve more objective, and quantitative measures that are seen to readily support tactical and operational decision making. This group might further be expected to perceive the main consequences for the evaluation in terms of instrumental use for program decision making.

As professional design and engineering staff in the case organization, non-management training program participants might be expected to consider evaluation largely in terms of their own interests, for example, in terms of the system of expertise. This group is expected to favor a more formative type of evaluation using qualitative data related to individual perceptions of program benefit. These can be described, for example, in terms of employee satisfaction, personal and professional development, and advancement in the organization. The main consequences of evaluation would be oriented towards program improvement to meet individual and group needs in terms of expertise and professional growth.

Training professionals, based on their organizational staff position as internal program providers, are expected to describe the purposes of evaluation as both formative and summative. This view would be consistent with their need to satisfy internal training

clients and to satisfy their own professional and organizational requirements for security, growth, and professional development. As such, both the processes and consequences favored by training professionals are expected to reflect a combination of views displayed by both client groups (sponsors and providers). These are further expected to reflect and accommodate their own group interests as internal training program providers. Major perceptions are expected to involve utilizing evaluation to both demonstrate tangible worth of the training program particularly to program sponsors (who have program budgeting authority and discretion) and also satisfy the interests and developmental needs of training participants as professional knowledge workers.

Summary and Relevance

Current training evaluation practice is limited by a restricted view of the audience and consequences of training evaluation. While it seems intuitively obvious that different stakeholder groups would tend to perceive training results in different ways as compared with other such groups, empirical evidence for this is patchy particularly in the context of learning organizations composed predominantly of knowledge workers. Training evaluation models that focus on measuring the return on investment of individual interventions from the singular perspective of management are rooted in classical views of organizations and their effectiveness. They ignore emergent notions of organizations as learning communities of shared knowledge and practice and largely fail to utilize the potentially diverse culture, values, and knowledge of the organization itself for improvement through the evaluation process. The current study seeks to fill these gaps through systematic investigation of perceptual variation related to training results and evaluation among key stakeholder groups. A better understanding of such variation has

the potential to contribute to knowledge related to both the theory and practice of training evaluation particularly in business organizations that rely heavily on the intellectual capital of their employees as their primary asset and means of competitiveness. The following chapter provides a review of literature and develops the conceptual framework used for the study.

Chapter 2

Literature Review

In view of the research questions presented, this chapter draws from and integrates several areas of extant knowledge to develop the conceptual framework presented at the conclusion of the chapter. Each knowledge area presented is but part of this emergent framework. The study implicates and relates three broad knowledge domains: (1) organizational studies specifically those related to complexity, effectiveness, power, and learning; (2) training especially current views of training and its evaluation in business organizations; and (3) program evaluation principally in terms of the purposes, processes, consequences, stakeholders, and contextual issues involved. Taken together these areas provide both a theoretically and empirically anchored foundation upon which the research aims to build. A central goal of this review (and the study as a whole) is to highlight the conceptual interconnections between training evaluation and the organizational context in which it occurs. In so doing, the aim is to produce a more realistic or contextualized picture to ultimately improve practice.

Organizational Context

Training and its evaluation occur within a contextual setting. In the case of a large firm this contextual setting is the organization. Many training evaluation approaches seek to evaluate the results of training specifically in terms of organizational or business results. Because of the complexity of organizations and the myriad variables involved in its overall performance, however, such training evaluation approaches often suffer from their inability to substantively trace the effects of training through to the

organization-level of effectiveness. Indeed, as discussed below, assessing the construct of organizational effectiveness is itself a complex process involving multiple-constituency views linked to the constructs of power and politics within the firm.

The Complex Nature of Organizations

Organizations are purposeful, functionally differentiated, social compositions in which individuals work as members of one or more formal or informal subunits on a sustained basis over time (Porter & Roberts, 1983). This definition captures the intended function and ostensibly rational nature of organizations, but the complexity of organizations has also been well documented (Dunnette, 1983; Graen, 1983; Mohan, 1979; Perrow, 1969; Scott, 1987). Viewing them as vast fragmented and multidimensional entities Daft and Weick (1984, p. 284), for example, reiterated Boulding's (1956) assertion that "organizations are among the most complex systems imaginable." This complexity makes problematic any unidimesional view of organizational effectiveness and suggests the need for a multiple-constituency approach. This aspect is discussed in more detail shortly.

Original notions of organizations as complex systems are rooted in general systems theory. According to Berrien (1983) systems theory emerged against a backdrop of social philosophical thought by Thomas Hobbes (1588-1679), Auguste Comte (1798-1857), Karl Marx (1818-1883), Herbert Spencer (1820-1903), and later the work of Mayo (1933), Roethlisberger (1944) and Parsons (1951). Berrien further recognized the influence of Bertalanffy's outline of General Systems Theory (1950) on comments made by Lwoff regarding the "potentials which lie in the general systems approach for spanning the natural and social sciences." (p. 43)

Conceptualizations of organizations as complex systems are pervasive in the literature. Thompson (1967, p. 6) wrote "Approached as a natural system, the complex organization is a set of interdependent parts which together make up a whole, which in turn is interdependent with some larger environment." Similarly, Beer (1983, p. 938) stated the following:

> ...substantial evidence has accumulated that organizations are much more than a collectivity of individuals. It is becoming clear that an organization is a complex social system (Katz & Kahn, 1966; Stogdill, 1959) whose outputs are dependent upon human inputs of abilities, needs, values, and expectations, on social processes at the interpersonal, group, and intergroup level (Argyris, 1962; Blake & Mouton, 1964; Dickson & Roethlisberger, 1966; Likert, 1961, 1967; McGregor, 1960), and on the organization's internal environment of technology (Trist & Bamforth, 1951) and structure (Burns & Stalker, 1961; Lawrence & Lorsch, 1967b; Woodward, 1967).

Many other authors and researchers have similarly described organizational complexity through the application of systems theory. Discussing change processes in organizations, Alderfer (1983) noted that open systems theory has been applied more frequently to organizations than to individuals or groups. Similarly referencing open systems, Hoy and Miskel (1991) emphasized the complex and dynamic nature of organizations and Owens (1991, p. 57) remarked, "Contemporary attempts to describe, explain, and predict organizational behavior generally depend—as does much of modern scientific thought—upon systems theory."

Regarding the evaluation of training in business organizations McLinden (1995, p. 15) also recognized that "Organizations are complex, and as such exhibit the characteristics of complex systems" while Kaufman, Keller, and Watkins (1996) further acknowledged the dimension of organizational complexity in training evaluation by adopting an open-systems view and recommending "an expanded framework" (p. 9) to assess training's value.

Socio-technical systems.

A related aspect of complexity involves the characteristics of hybrid or overlapping technologies and subsystems in the organization. Multiple authors (Burke, 1987; Hackman, 1983; Starbuck, 1983) have recognized the influence of the original work of Trist and Bamforth (1951) in organizational studies. Pepitone (1995) reviewed several such studies specifically in relation to training and development. He noted that Trist and Bamforth created the term socio-technical system to characterize the interaction of people (social system) with tools and techniques (technical system):

> Trist, Emery and others continued to study socio-technical systems between 1949 and 1958, creating an entirely new paradigm for organizing and managing work....Trist and others had pioneered a new set of principles for organizing and managing that were a sharp contrast to classical management theory. Building on new social knowledge unavailable to Smith, Fayol, Taylor, and others in the early twentieth century, these new principles focused on the whole system for analysis and design. (p. 44)

The socio-technical systems view was significant because it elevated training's stature and foreshadowed a growing awareness of the interrelationships between the human

element and effectiveness in organizations. According to Burack (1993) in new paradigm organizations characterized as open systems and socio-technical structures, people become the primary asset of the firm. In effect knowledge workers are moved into the corporate financial statement so that their impact is clearly discernible and they become truly a second bottom line.

The socio-technical system view also highlighted the role of knowledge as an organizational technology. For example, in an effort to understand individuals and groups in complex organizations Hulin and Roznowski (1985) built on Thompson's (1967) work to define organizational technology as the physical combined with the intellectual or knowledge processes by which materials are transformed into outputs used by another organization or subsystem within the same organization. Additionally, Kilmann and Kilmann (1991) described knowledge as the most important technology and limiting factor with regard to organizational effectiveness:

> The most important technology in nonroutine systems is knowledge. Therefore, organizational effectiveness is directly related to the capacity of the organization to develop and utilize knowledge. The availability of knowledge at key choice points sets an upper limit on organizational effectiveness; the organization will be no more effective than allowed by knowledge that is used to guide decisions. (p. 380-381)

These comments explicitly link organizational knowledge with organizational effectiveness. This linkage is straightforward and intuitively logical particularly in organizations of knowledge workers. However, the study of organizational learning constitutes an area of inquiry unto its own. Although an exhaustive review of this

developing literature is beyond the scope of the present study, a consideration of the role of training in organizational learning is included later in this literature review. The next section focuses on the construct of organizational effectiveness.

Organizational Effectiveness

An understanding of the organizational effectiveness literature is required to conceptually orient subsequent discussions of training evaluation that emphasize training's role in contributing to the effectiveness of the organization. For now it should be noted that, perhaps because a substantial amount of the organizational effectiveness literature was developed and organized after 1959 (when Kirkpatrick described training evaluation in terms of results in the organization), a thorough consideration of the mechanisms and complexities of organizational effectiveness was absent from Kirkpatrick's evaluation taxonomy. Nevertheless, the conceptual influence of this taxonomy has clearly continued in the training evaluation literature. For example, referencing Kirkpatrick's taxonomy, Basarab and Root (1992) described training results specifically in terms of impact at the level of the organization. Also, in adapting the notion of organizational results, Brinkerhoff (1987) stated "Stage VI evaluation will help determine whether the HRD [human resources development] program was worth it in terms of the value that has resulted to the organization" (p. 162).

The conceptual precursors of organization effectiveness emerged in the early part of this century with the development of "classical" organizational theory. As cited by Spray (1976) foundational works include Taylor (1911), Gulick (1937), Banard (1938), Urwick (1943), Weber (1947), and Fayol (1949). Since the establishment of these early roots, the literature has continued to grow substantially to include a broad and diverse

range of theory and research (Gross & Etzioni, 1985; Hall, 1980, 1987; Koza, & Thoenig, 1995; Perrow, 1992; Schmidt, 1987). Yet, even given the burgeoning organizational literature, determining and measuring the effectiveness of organizations remains complex and problematic. For example, Evan (1976) emphasized the striking—almost systematic—neglect of discussions on the problem of conceptualizing and measuring organizational performance or organizational effectiveness.

In diverging from the classical, mostly financial, indicators of organizational performance, Likert (1977) distinguished "traditional theory" from "modified theory." The former is based on scientific management and cost accounting concepts while the latter is concerned with the human organization and concepts such as confidence, trust, motivation, loyalty, and communication. In later work, Campbell (1976) proposed to move the area of inquiry forward by defining organizational effectiveness as a construct using the "goal-centered" and "natural systems" views as two general models. The goal-centered view references "principal power centers or decision makers" (p. 31) to define rational goals by objective measures and deductive means. The natural systems view abandons the possibility of meaningfully defining any small set of goals and embraces more inductive mode of analysis. After categorizing several specific models (e.g., Cost/Benefit Analysis, Management by Objectives, the Organization Development or OD Model, the Likert ISR Model, and the Industrial/Organizational Psychology Criterion Model) having either a predominantly goal-centered or natural systems orientation Campbell suggested combining the approaches to "use the complimentary insights provided by each" (p. 35). Based on a review of the empirical literature on criterion measures of organizational effectiveness Campbell further detailed a total of 30 such

indicators. Among these are "goal consensus", defined as the degree to which all individuals perceive the same goals for the organization (which is distinct from actual commitment to those goals) and "training and development emphasis" defined as the amount of effort the organization devotes to developing its human resources. Further recognizing that "In the best of all possible worlds, it would be nice to have some overall hierarchical map of how the criteria fit together in terms of their generality/specificity and means/ends relationships" (p. 39), Campbell recommended continued research to describe the relationship between formal and operative goals using several groups of individuals who might offer differing perspectives or expertise. The research design described in the following chapter embraces this recommendation specifically by involving multiple stakeholder groups to describe their views of training results and evaluation in the organization.

Multiple-Constituency Views of Effectiveness

Assessing organizational effectiveness is an intrinsically multipolar enterprise. In describing a multiple-constituency approach to organizational effectiveness, Connolly, Conlon, and Deutsch (1980) stated

> In general, then, we treat effectiveness not as a single statement, but as a set of several (or perhaps many) statements, each reflecting the evaluative criteria applied by the various constituencies involved to a greater or lesser degree with the focal organization. (p. 213)

Building on this work more recently Altschuld and Zheng (1995) reviewed several evaluative models and theories. These authors reviewed Thompson's (1967) Goal/Technology Contingency Table and the use of social reference groups for

effectiveness assessment. They suggested that in the absence of absolute criteria and causality related to outcome, complex organizations should turn to social referents to demonstrate their effectiveness. Referencing the "strategic constituency approach" for assessing effectiveness they further recognized that the satisfaction of constituent groups or individuals are indicators of an organization's effectiveness. Altschuld and Zheng also recognized how the evaluator's role can become altered to include the management of politics stating that evaluators must also be political managers who orchestrate the involvement of varied interest groups. They also noted that "Daft (1989) argued the constituency approach is essentially a manifestation of the open-system theory...Constituency satisfaction is a key concept in open-systems theory." (p. 206) This reasoning provided a basis for the development of the competing values framework for assessing effectiveness. This framework suggests that there cannot be a single, universally acceptable model of organizational effectiveness because concepts of effectiveness are value judgments based on the evaluator's personal beliefs, interests, and experiences. In assessing effectiveness, evaluators must determine what an organization's processes, behaviors, and ultimate goals are, or should be. This view is further supported by Campbell (1976) who noted that there is no algorithm of science that will specify which variables should be labeled as criteria of organizational effectiveness. According to Campbell (p. 40), "That begins as a value judgment and ends as a political decision."

Power and politics.

The essence of any organization is a social system fraught with consequent power relations. Bandura (1986) recognized this stating "The 'social system' is not a monolith.

Rather, it comprises numerous constituencies, each vying for power and lobbying for its own interests in shifting coalitions" (p. 452). This view is congruous with the use of multiple-constituency approaches to assess organizational effectiveness. It also highlights the inherent nature of power and politics in complex organizations.

Several authors have offered definitions for power and politics in organizations. Emphasizing that power is first and foremost a structural phenomenon in organizations, Pfeffer (1981, p. 2) observed that "Most definitions of power include an element indicating that power is the capability of one social actor to overcome resistance in achieving a desired objective or result." Pfeffer also noted that "Power is a property of the system at rest; politics is the study of power in action." (p. 7) He further recognized organizational politics to involve intentional acts of influence to enhance or protect the self-interest of individuals or groups:

> Organizational politics involves those activities taken within organizations to acquire, develop, and use power and other resources to obtain one's preferred outcomes in a situation in which there is uncertainty or dissensus about choices. (p. 7)

Pfeffer (1992) later summarized these previous definitions defining organizational politics simply as the exercise or use of power, with power being defined as a potential force and further characterizing organizational power and politics as an important social process that is often required to get things accomplished in interdependent systems. These definitions underscore the social dimensions of power and politics in organizations.

Acknowledging the possibilities to debate definitions of power endlessly Mintzberg (1983) defined power as "the capacity to effect (or affect) organizational outcomes" (p. 4). Within this framework two of the three primary bases of organizational power and control are defined in terms of "a technical skill" and "a body of knowledge" (p. 24). Because training maps directly onto both of these areas the linkage between training, its evaluation, and organizational power and politics is clear.

Politics is defined as an informal or illegitimate subset of power. Mintzberg's framework recognizes coalitions both internal and external to the organization. According to Mintzberg "A System of Politics arises in the Internal Coalition" (p. 171) as one of four internal power systems. The three other (legitimate) members of this organizational power tetrad include the system of authority, system of ideology, and system of expertise.

Three distinctive and well-defined stakeholder groups in any large, knowledge-based organization might include (1) line management, (2) core staff, and (3) support staff. According to Mintzberg (1983) line-level managers would be expected to invoke power and political influence based on the system of authority characterized by position power, budgeting discretion, and accountability. This group is simultaneously influenced by the goals and directives of the chief executive officer (CEO) and their own goals related to health and expansion of the units they manage. Both of these influences involve organizational growth and expansion. Based on their orientation within the system of authority and need for rationalistic decisions using quantitative indicators (such as those involved with budgets), this group might be expected to place higher value on the traditional versus emergent training program outcome indicators.

The core knowledge worker staff might be described as "professional operators". according to Mintzberg's framework. Their power and political basis involves the system of expertise. Characterized by a normative reward system and high intrinsic satisfaction, their goals might be expected to involve protection and especially autonomy of the group, then enhancement of the prestige and resources of the specialty and professional excellence (sometimes in spite of customer need), and when customer-professional relationships are close and personal, support of the organization's mission. As professionals, individuals in this group would tend to take pleasure in their work and would be expected to place a higher relative value on emergent indicators, particularly those related to career and professional growth as well as job satisfaction.

Support staff would include training program developers and training managers. This group develops and implements training for internal organizational clients. They might also provide related services such as training needs assessment. This group is expected to invoke a hybridized form of power and influence characterized by their dual roles as "analysts of the technostructure" and "professional support staffers" described by Mintzberg. As analysts (e.g., performing training needs analyses) this group is expected to favor professional group excellence and perpetual but moderate and well-regulated change in the organization. According to Mintzberg, the analysts are motivated by the need to demonstrate the tangible worth of their technocratic systems in terms of operational goals achieved. This means that the analyst is forced to favor operational goals of the organization (as those that best lend themselves to traditional measures of performance). As professional support staffers, this group is not wedded to analysis per se, but rather to its application in delivering, for example, emergent training results. As a

result, they have no particular obsession with operational goals or economic efficiency. Also, because they are vulnerable (since their services can be purchased externally), training professionals as a support group are expected to push for involvement and collaboration with program sponsors in the decision making process affecting the training program. Based on their dual roles (as support staff and analysts), training providers are expected to subscribe to both traditional and emergent training results.

Describing a typology of social power, Cavanaugh (1984) collapsed a variety of theory to describe power in terms of five frameworks. These illustrate unique dimensions of the concept and include descriptions of power as a characteristic of the individual, an interpersonal construct, a commodity, a causal construct, and as a philosophical construct. Further examination of these shows that each framework subsumes a substantial body of literature (see e.g., Bennis & Nanus, 1985; Tichy & Sherman, 1994; Yukl, 1989) and that no one framework singly describes power in relation to the goals and effectiveness of the organization.

The characterization of organizational effectiveness as expectations fulfillment and goal-attainment is valid only to the extent that rational means provide for the achievement of clear ends (goals). But in asking "How obvious are organizational goals?" Lawler (1983) noted that, particularly in large organizations, "When organizational goals are not clear and generally accepted, there is a tendency for individuals to focus on organizational subunit goals" (p. 1258). In terms of the system of authority embraced by managers in the case organization (as discussed later) this usually involves motives toward the growth of their own departments.

The nature of goals has long been considered in the organizational literature, however, the relationships between goals and power is a somewhat more recent focus of attention. Mintzberg (1983) explicitly connected organizational goals and power by summarizing six scenarios involving organizational actors and goals. Of these six, two are most relevant in terms of the evaluation of training for organizational results. These involve (1) multiple actors/multiple goals and, (2) multiple actors/no goals. Mintzberg respectively credited these two theoretical positions to Cyert and March (1963), and Georgiou (1973). These two conditions, in which goals become diffuse and then effectively disappear as an organizational referent, further pave the way for consideration of a special kind of power present in organizations, namely, political power. Political power has been defined in terms of legitimacy in the organizational context. Hoy and Miskel (1991) summarized conceptions of the legitimacy and formality of power and authority to describe and compare six typologies including Mintzberg's (1983). They observed that only Mintzberg's formulation considers power that is both illegitimate and informal in terms of the system of politics. Thus, Mintzberg's framework is particularly relevant to present research because of its explicit consideration of this softer, or more informal, exercise of power available to a range of organizational actors and groups.

A recurring theme in the brief review of the power literature as described above revolves around the social nature of organizations. As attested to by the comments and work of Bandura mentioned earlier, this single aspect lies at the heart of organizational studies. Indeed, in connection with his discussion of organizational power and politics, Pfeffer (1981) acknowledged the notion of socially constructed reality especially in connection with political language and symbolic action within organizations. But the

idea of social knowledge construction (see, e.g., Geertz, 1983) forms a far broader foundation. Louis (1995), for example connected "Theories of social structure, political theory, organizational theory, and cognitive learning theory" (p. 1). Although focused on exploring the need for further knowledge dissemination and utilization theory development, Louis' integration of these theoretical perspectives obviously relates well to the present study because it also embraces several of these same domains. Indeed, topics of organizational effectiveness, evaluation, training, power, and politics all lend themselves well to discussions of learning in the organization.

Organizational Learning

The many complex modes and mechanisms of informal or non-training learning are prominent in the organizational literature. Several recent works have summarized and discussed the literature on organizational learning in connection with training or education (Cousins, 1996; Gordon, 1992b; Rait, 1995; Robinson, 1997). Rather than replicate such efforts, the purpose of the following selective review is to acknowledge and highlight learning that occurs in the organization in ways other than through formalized programs of training. This is an especially important consideration because, if the effectiveness of organizations is tied increasingly to more macroscopic and complex modes of knowledge acquisition (e.g., organizational learning), then training evaluation models that attempt to isolate the organization-level results of training become highly questionable. The role of training in learning organizations is expanded upon later in this review.

As mentioned, Louis (1995) considered organizational learning in connection with knowledge utilization and dissemination theory. She highlighted both the local and social construction of knowledge within organizations:

> Organization learning begins with a social constructivist perspective: knowledge is not useable at the local site until it has been "socially processed" through some collective discussion and agreement of its validity and applicability (Louis, 1994). Organizations that are more effective in using knowledge have certain characteristics for example, they have denser internal communication networks, and more individuals serve in boundary spanning roles where they legitimately bring in new ideas from the outside. (p. 13)

This view fits into what Daft and Huber (1987) have labeled the "interpretive perspective" of organizational learning and further implies that "learning need not result in changes in behavior" as noted by Huber (1991, p. 89).

Based on an extensive review of relevant literature, organizational learning outcomes have been described in terms of seven complex and interrelated dimensions including social learning, knowledge representation, behavioral versus cognitive distinctions, levels of learning, system-structural versus interpretive perspectives, organizational memory, and duetero learning (Cousins, 1996). Amidst such complexity determining the purpose and results of training in an information-abundant and technologically-advanced organizational culture of high-expertise, knowledge workers is particularly challenging because, in a very real sense, such individuals take a break from learning on the job to participate in formal training.

Drawing on the previous work of Orr (1987, 1990), Brown and Duguid (1991) described the concept of "learning in working" in contrast to more traditional organizational views: "Much conventional learning theory, including that implicit in most training courses, tends to endorse the valuation of abstract knowledge over actual practice and as a result to separate learning from working, and more significantly, learners from workers" (p. 41).

Other authors have focused on the role of technology in developing organizational learning. For example, Huber (1990) has proposed a theory of the effects of advanced information technologies on organizational design, intelligence, and decision making. Similarly, Marchionini and Maurer (1995) discussed the roles of digital libraries in teaching and learning. The rapid development of the internet and, particularly, the world wide web has also contributed to the exponentiation of alternatives for employee and organizational learning (Hert, 1994) and training (Pollack & Masters, 1997). Still others have sought to understand organizations as learning systems (Nevis, DiBella, & Gould, 1995) or voluntary learning networks in the context of the "intelligent organization" (Pinchot & Pinchot, 1993). Yet amidst these various modes and possibilities for organizational learning, formalized training continues to be identified and even evaluated as a primary intervention to develop knowledge in the organization.

Training

Any discussion of training and its evaluation implies the need for at least a working definition of the term "training". Yet this term is extremely broad. It has been applied to a strikingly wide and diverse spectrum of interventions and activities concerned with cognitive and/or behavioral change. Even when limited to the context of

an organization, the concept of training can be simultaneously liberating and restricting. On the one hand, training that develops new knowledge, skills, and attitudes can be seen as personally beneficial and empowering. On the other hand, training that prescribes can be seen as personally and intellectually limiting. While various learning interventions can be clearly and readily labeled as training (or non-training) the current literature suggests the presence of a large "gray area" in which applying the term becomes problematic.

Problems of Definition

"Training is a planned learning activity that makes a measurable contribution to the job competency and stability of employees in an organization." This Public Service Commission of Canada (p. 3) definition probably served well in 1984 when it was published. Yet in the context of complex organizations, globally competitive businesses, and communities of knowledge workers it raises some important questions from an evaluation perspective: Planned by who? What is or more importantly what should be the "measurable contribution" to the individual or organization? What is a "stable employee" and is this a desirable outcome of training in a fast changing (Morgan, 1988), globally competitive (Drucker, 1995), or chaotic (Peters, 1988) business environment of the later 1990s?

The term training is so ubiquitous for many it almost seems to not require any formal definition. However, if one asks a number of different people (or consults the literature) to define the term, a range of usable definitions inevitably emerges. This range might include any number of descriptions from structured learning events, to a process of knowledge and skill acquisition, to an athletic preparation routine, to a

procedure aimed at the family pet. *Merriam Webster's Tenth Collegiate Dictionary* (1994) offers the following definitions: train (verb) "to teach so as to make fit, qualified, or proficient"; training (noun, 1548) "the skill , knowledge, or experience acquired by one that trains: the state of being trained". (p. 1252) For "training" used as a term or concept in isolation these, or any other reasonable definitions, might suffice.

While possibly implying humans, notice that the definitions above apply equally well to non-humans. Consider the following description of "The I.Q. Zoo"

> The animals at the I.Q. Zoo are special, but they're not really smarter than others of their kind. The thing that makes them different is the *training* they have had. They've been *trained* by an organization called Animal Behavior Enterprises, founded by Keller and Marian Breland, two psychologists, in 1947. The organization is made up of scientists and technicians who apply the science of behavior to understanding and controlling the behavior of animals. The organization has trained more than 8,000 animals, from cockroaches to whales. (Grolier, 1980, p. 74, emphasis added)

As this quotation from *The New Book of Knowledge Annual* could be interpreted in different ways, it serves here to highlight some different uses of the term "training." Particularly interesting is the very specific purpose mentioned "controlling the behavior of animals."

Even if the discussion of training is limited to humans as adult learners (Knowles, 1990; Wlodkowski, 1985), defining the term remains problematic in complex organizations of knowledge workers (e.g., At what point does "training" interfere with creativity or new ways of working?). This obviously makes evaluating training results at

the organization-level that much more problematic. While several training evaluation frameworks make assumptions about the organizational results of training, no training process or methodology can ensure intended results from a behavioral point of view. This point is attested to by Thompson (1967) in his discussion of "the variable human" in organizations:

> The human actor is a multidimensional phenomenon subject to the influences of a great many variables. The range of differences in aptitude is great, and the learned behavior patterns (considering mankind as a whole) is quite diverse. Neither we nor organizations have the data or the calculus to understand organization members in their full complexity and the requirements of complicated technologies in complicated task environments cannot be met if the full range of human variations comes into play within the organization. (p. 101)

This observation captures the essence of the historic and continuing difficulty to "prove" the results of training at the organization-level. Training remains a variable among myriad complex variables that determine such results.

In exploring the question "Is there a psychology of personnel training?" Hinrichs (1983) noted that any description of training practices invariably is a mishmash of different frames of reference reflecting how the field has evolved without direction or unifying theory. According to Hinrichs (p. 831) "It is practically impossible to develop any meaningful description of the psychology of personnel training around such a conceptual monstrosity." Nevertheless, the idea of a training is related to planned or structured learning by people in organizations. Hinrichs offered the following definitions:

> *Training* may be defined as any organizationally initiated procedures which are intended to foster learning among organizational members. Needless to say, the desired learning is in a direction which is intended to contribute to overall organizational objectives. *Learning* may be thought of as a process by which an individual's pattern of behavior is changed by experience—for our purposes, the catalytic experience of exposure to the training activity. So, training is a systematic intentional process of altering behavior of organization members in a direction which contributes to organizational effectiveness. (p. 832)

These definitions are particularly relevant here because they relate training to learning and cast both as contributors to organizational effectiveness.

Other definitions abound. In considering how the field of human resource development (HRD) includes training, education, and development, Nadler (1984) distinguished these in terms of knowledge or skill application and relevance to a person's job. The term "training" applies to the acquisition of knowledge or skill for a person's current job. "Education" applies to learning for a specific future job in the organization (on the person's "career path"), and "development" is learning for growth of the individual but not related to a specific present of future job. Nadler further defined HRD as "organized learning experiences in a definite time period to increase the possibility of improving job performance growth." (p 1.3) These definitions are useful because, rather than implying a static focus on an existing fixed job, they accommodate future (even unknown) performance in the organization. While such distinctions serve to clarify planned learning, it should be noted that the term "training" continues to be used to refer to any of purposes mentioned above.

Since the statement of these (and other) operational definitions of training, authors have continued to define their terms. Even in some of the most recent literature, authors continue to discuss, qualify, and otherwise attempt to carefully clarify and define, what they mean when they use the term. While many authors usually consider the term in a broad sense more akin to Nadler's definition of HRD, Lewis (1996), takes exception to the continued use of the term "training" at all:

> In the society at large, training has a narrow circumscribed meaning. One is trained to do this or that. Animals can be trained. Thus, the term 'training' has appeared to this author to be inappropriate with reference to people. 'Training' does not connote reflection (see Schön, 1983). One acts the way one was trained to act. It implies that there is one way. The term 'training' was conducive, perhaps, for Tayloristic work environments, where uniformity was the coin of the realm, and where people could be slotted into systems—assembly lines—to perform discrete functions in predictable ways. But workplaces and work have changed and indeed the very notion of skill and what workplaces require has changed. Concepts and desired skill clusters such as problem solving, lifelong learning, communicating, being flexible, and ability to work in teams, and learning how to learn, do not square with the concept 'training'. (p. 10)

In outlining his model for thinking about the evaluation of training it is interesting that Lewis distinguishes between so-called "corporatist" and "humanist" perspectives of training. This distinction is based on the aims of training to meet the goals of the organization (corporatist), versus the goals of the individual (humanist). While others have also distinguished the benefits of training in terms of the individual versus the

organization (e.g., Nadler), this view seems most reminiscent of the social systems model distinction between the "nomothetic" or institutional, and "idiographic" or personal dimensions proposed by Getzels and Guba (1957). As modern organizations pay increasing attention to the overall satisfaction of their employees as highly educated and mobile knowledge workers such distinctions take on new relevance.

Another notable aspect of Lewis' suggestion to do away with the term "training" is his reference to "Tayloristic work environments" as contrasted with requirements of the modern workplace. Although maintaining use of the term "training" for practical reasons, Pepitone (1995) seems to support Lewis' conclusions about its anachronistic usage. In his discussion on "Teaching Work", Pepitone traced conceptions of job knowledge beginning with 18th century views of craft knowledge in terms of mystery, artistry, and experience. Mentioning selected historical influences (such as the publishing of the "Encyclopédie" in 1751 which served to help convert previous craft knowledge into textbook knowledge for others to learn; Adam Smith's "The Wealth of Nations" published in 1776; and the industrial revolution, 1780-1880, among others), Pepitone outlined the impacts of Henri Fayol's "14 management principles" and Fredrick Taylor's study of "work design" on the shaping of classical management theory for organizing and managing work. By further recognizing influential work by a range of authors including Lewin (1947; cited in Owens, 1991), especially on field theory and "force-field analysis"; Trist and Bamforth; and others, Pepitone integrated a number of more modern works (e.g., Juran and Deming on quality; McGregor, 1960; Cherns, 1976; Emery, 1978; Gilbert, 1978; Katz & Kahn, 1978; Argyris, 1982; Morgan, 1986; Weisbord, 1987; Hanna, 1988; D. A. Nadler, 1992; Drucker, 1993; Hammer & Champy,

1993; R.M. Kanter, 1994, and others) to synthesize a "fourth generation" of instructional technology rooted in conceptions of human performance technology:

> We approach a future that will require the achievement of maximum results from people, and this achievement will happen only if we find ways of managing that both employees and the organization they serve will value. To accomplish these goals, there is a pressing need for the organization and integration of existing knowledge in the field of work and human performance. Now, coming from theorists and practitioners in many diverse fields of study, including management, engineering, education, sociology, psychology and economics, a field of human performance technology is emerging. Starting where the evolution of machine technology has taken us, these technologies to enhance human capabilities are emerging as new priorities for competing organizations. (p. 57)

So from humble beginnings related to classical organizational theory and mechanistic modes of labor an image emerges in which training is cast as one (presumably important) input into an integrated cloud of complex factors affecting organizational effectiveness and described in terms of human performance technology (see, e.g., Robinson & Robinson, 1996; Stolovitch & Keeps, 1992) and learning organizations.

Training and Learning Organizations

According to Cousins and MacDonald (1998) it is sensible to think about the impact of training within an organizational learning framework. The connection between training and organizational learning has received increasing attention in the literature. Indeed, particularly in contrast to the traditional indicators, the emergent relationship between organizational learning and training provides an intuitively natural fit and one

that deserves increased attention. This view has both sustained and stimulated discussions about training's contribution to organizational performance (Bridges, 1994; Drucker, 1993a,b, 1995; Gale, 1994; Likert, 1977; Morgan, 1988, 1993; Peters, 1988; Pfeffer, 1994; Pinchot & Pinchot, 1993). For example, According to Wick and Leon (1995):

> No matter what label is attached to it, learning undergirds all the current theories on how to achieve business success. The working title may be reengineering, or quality, or fast cycle time, but learning provides the foundation without which any attempts at improvement fall flat. Through our research into managerial learning and our studies of companies adept at learning, we have identified the elements necessary for companies to become learning organizations. We define a learning organization as one that continually improves by rapidly creating and refining the capabilities needed for future success. (p.299)

Yet the organizational effects of training have been studied empirically for at least the past 30 years. For example, Eddy, Glad, and Wilkins (1967) stated "Employee training in its various forms may be thought of as a vehicle for improving organization effectiveness" (p. 15). In parallel to training evaluation research and theory, the results of training are increasingly discussed in terms of organizational learning (Dixon, 1992; Gayeski, 1996; Kline & Saunders, 1993; Kramlinger, 1992; Watkins & Marsick, 1992).

Although training's connection to organizational learning has been widely touted, with few exceptions (e.g., Dixon, 1992) there is a distinctive dearth of published works that describe the function, role, or evaluation of training in terms of the more

foundational organizational learning work (e.g., Argyris & Schön, 1978; Cyert & March, 1963; Daft & Huber, 1987; Hedberg, 1981; Huber, 1991).

From a theoretical point of view, training can be thought to augment "vicarious learning" (Huber, 1991) in which organizations commonly attempt to learn about the strategies, administrative practices, and especially technologies of other organizations. And, while training attempts to stimulate learning in individuals, organizational learning is more than the sum of the learning of individuals (Argyris, & Schön; 1978). Rather, training represents one approach to the enhancement of organizational learning capacity defined as "the capacity to increase the volume of data processed by the organization, and the capacity to reduce equivocality" (Daft & Huber, 1987, p. 13). The reduction of equivocality also figures into the framework proposed by Hulin and Roznowski (1985) who discuss training as a system designed to protect the organization's core technology from equivocality and uncertainty in the environment. While, beyond the scope of the present study, it is interesting to contrast the potential of technology to increase—versus the potential for training to decrease—equivocality in the organization. Such descriptions of training's role are useful, from the perspective of both definition and evaluation, because they relate training to the broader domain of studies concerned with organizational learning.

Beyond the direct role of training in organizational learning, there are also opportunities for organizational learning to occur based specifically on the evaluation of training. Yet, given the relatively weak state of training evaluation practice in business and industry (described below), opportunities for substantial organizational learning through training evaluation are rare. This is because training evaluation is widely

practiced, as a low risk/low return type activity by a separate stakeholder group of training professionals who are cast into an evaluation role. Such evaluation efforts typically lead to little more than propagation of the status quo with limited dissemination and organization-level learning. That is, continuing to evaluate training in the same ways tends to have a validating effect which limits organizational learning to what has been variously described as "first order" (Lant and Mezias, 1992), or "single loop" (Argyris and Schön, 1978) learning. This is characterized as "incremental" (Eisenstat, 1985) or "adaptive" (Senge, 1990) learning that is relatively shallow and which preserves an organization's "theories in use".[4] Such limited learning is seen to be at least partly responsible for the continued propagation of inefficient and ineffective training practices such as those described by Cocheu (1993):

> The ultimate objective of any training is to give the right people the right knowledge and skill at the right times to help them do 'the right things right.' But the traditional 'spray and pray' approach to industrial training has not always had this result. In this approach, people are randomly brought together in a classroom, given theoretical knowledge, and sent back into the workplace with the hope that they will be able to apply the knowledge and improve things. The experiences of one organization after another have been disappointing. Sending people to class does not by itself result in the application of learning to the job. (p. 98)

As noted some authors (see, above, the comments of Brinkerhoff & Gill, 1994) have criticized traditional training evaluation for focusing too much on the event not the

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[4] Senge contrasted espoused theories commonly proclaimed in organizations with more deeply embedded theories in use. Such theories may actually guide behavior and decisions in the organization regardless espoused theories.

process. An extension of this criticism is that the traditional frame focuses on evaluating the training event, rather than its true goal of learning. However, training's relation to contextual learning and socially-constructed organizational knowledge has not gone largely unexplored although not entirely unnoticed.

As the professional training community continues to use training evaluation to extol training's virtues and benefits within the organization others have raised doubts regarding the ultimate results of training as typically practiced. For example, Brown and Duguid (1991) noted that theories of learning implicated in the way training is typically practiced view learning from the abstract stance of pedagogy:

> Training is thought of as the *transmission* of explicit, abstract knowledge from the head of someone who knows to the head of someone who does not in surroundings that specifically exclude the complexities of practice and the communities of practitioners. The setting for learning is simply assumed not to matter. Concepts of knowledge or information transfer, however, have been under increasing attack in recent years from a variety of sources (e.g., Reddy, 1979). In particular, learning theorists (e.g., Lave, 1988); Lave and Wenger, 1990) have rejected transfer models, which isolate knowledge from practice, and developed a view of learning as social construction, putting knowledge back into the contexts in which it has meaning (see also Brown, Collins, and Duguid, 1989; Brown and Duguid, in press; Pea, 1990). From this perspective, learners can in one way or another be seen to construct their understanding out of a wide range of materials that include ambient social and physical circumstances and the histories and social relations of the people involved. (p. 47)

Observations such as these seem to take on increased relevance in view of the way training is conceived, executed, and evaluated particularly in the context of an information rich organizational environment of professional knowledge workers.

As alluded to earlier in discussing the problems of defining the term "training," when viewed in the context of a learning organization of knowledge workers, the preceding discussion supports the need to more carefully define training for purposes of evaluation particularly in terms of organizational results among varied stakeholders in the organization. In the context of a traditional bureaucratic organizational hierarchy of low-skilled workers reporting to generally more highly educated managers it probably made sense for training to be prescribed to employees by management. However, given a knowledge-based organization that is information-rich with intellectual property this no longer is the case. The comments of Marchionini and Maurer (1995) support this view

> Professional learning refers to the ongoing learning adults engage in to do their work and to improve their work-related knowledge and skills. In fact, for many professionals learning is the central aspect of their work. Like informal learning, it is mainly self-directed; but unlike formal or informal learning, it is focused on a specific field closely linked to job performance, aims to be comprehensive, and is acquired and applied longitudinally. (p. 68-69)

The point here is that the traditional way in which training is performed and evaluated either completely ignores, or tacitly dismisses the complex organizational context for learning. It tends to focus instead on endless debates over, for example, the best media or technologies to be used, or the logistics of implementation (see, e.g., Ashe & Buell, 1998). Gayeski (1997) would seem to agree with this point:

> Traditional training where managers order up days of training and send their employees to courses to be "done over" doesn't support today's continuously learning, diverse, distributed, and empowered workforce. We need to "rewire" our organizations' learning and communication systems, both philosophically and technically. (p. 36)

This view further illustrates how definitions and concepts of training have changed in the context of complex, learning organizations of knowledge workers. These changes continue to present a challenge to training evaluators. While much has been done in the specific area of training evaluation, much yet remains to be accomplished. The following review focuses on training evaluation theory, research, and practice.

Training Evaluation

In a personal communication Brinkerhoff (1992) stated:

> In my mind, there is plenty of theory about, but not enough demonstrable procedures and methods that attract people to use them; evaluation remains in the province of academics and researchers. (personal communication, November 17)

This brief comment, in many ways summarizes the status of training evaluation theory, research, and practice even today. As organized below, the training evaluation literature can be most logically separated into at least two broad categories: (1) that related to practice, and (2) that related to theory and research. But, as implied by Brinkerhoff, this taxonomy also suggests a rift.

Current practice seems to have squeezed huge "mileage" out of little theory. Given this, much current practice remains fixated on demonstrating training's organizational value to management, largely in economic terms. Yet, this view of

evaluation either completely fails to address or very inadequately addresses training's relationship to the organization in terms of its complexity, effectiveness, learning, stakeholder dynamics, power, and politics as outlined above. While this situation can be cast in terms of methodological or procedural inadequacies, it serves to limit the use of emerging theoretical and empirical work by practitioners who continue to bemoan the inadequacy training of evaluation while, at the same time, continuing along a well-worn path of practice.

Corporate and Professional Practice

Employee training is generally advocated as a corporate necessity particularly in technologically advanced industries. This is reflected in much of the management literature (e.g., Drucker, 1995; Gale, 1994; Hammer & Champy, 1993; Morgan, 1988, 1993; Peters, 1988). Based on this, much of the current training evaluation literature focuses on assessing training's role to enhance organizational performance through strategic learning. In particular the notion that training should be strategically "linked" to key business objectives has been widely espoused. This notion (easily traceable back to Kirkpatrick's forth-level of organizational training results) has been stated and restated by multiple authors. For example, Carr (1992) emphasized that training cannot be separated from the overall goals and strategy of the firm and that it is smart only when it is strategic in creating and maintaining the core competence of the firm. Robinson and Robinson (1989) have provided similar emphasis in their book on the subject, while Phillips (1991) echoing similar views also suggested the involvement of training staff and key management in the evaluation of training.

Yet, amidst an ostensibly universal advocacy for training evaluation, the organized evaluation of professional corporate training and development programs has been notoriously weak. Birnbrauer (1987) noted that "Every HRD professional pays lip service to the idea that evaluation is important to successful training, but few conduct complete and thorough evaluations." Similarly, Hennecke (1988) observed that most management trainers don't really know whether their efforts are effective, and still fewer know how to evaluate a program's impact. Other such critiques abound. For example, Brinkerhoff (1989) asserted that evaluation business-as-usual will not help to position training as the important business partner it could and should be, while Dixon (1990) stated:

> For the last twenty years human resource development (HRD) professionals have been urged to evaluate the results of their efforts. The need for evaluation has been the topic of numerous journal articles and presentations at national conferences. Yet as recently as 1988, a report on forty-five Fortune 500 companies showed that although 100 percent of the organizations used some form of participant reaction form, only 30 percent used measures of learning and only 15 percent used measures of behavior (Brandenburg and Schultz, 1988). (p. 1)

More recently Lewis (1994) observed that there seems to be a widespread agreement with the proposition that evaluation is the least well conducted aspect of all training activities. In general agreement with the findings of Brandenburg and Smith (1986) and Dixon (discussed above), Bassi, Benson, and Cheney (1996) recently observed that "Only Level 1 evaluations are common, conducted for 94 percent of all companies" (p. 38) These authors further mentioned that level 2, 3, and 4 evaluations are

performed respectively by 34%, 13%, and 3% based on their survey of corporations in the United States.

Perhaps as a reaction to this generally weak corporate evaluation scene, there has also been a growing and constant call in professional training literature for increased evaluation. Quite representative of the message here is a quote from Geber (1995): "Blame TQM (total quality management) or downsizing or impatient managers...Fact is, trainers are being pressured to evaluate training courses at much deeper levels." In addition to simply wishing to improve the results of training in a professional sense, Geber's quotation points out two conditions that have led to calls for increased training evaluation. These include (1) investment justification, and (2) the rise of the quality movement (see, e.g., Garvin, 1988; Hugh, 1990; Juran, 1989; Zeithaml, Parasuraman, & Berry, 1990).

The idea of investment justification involves the idea that training costs and benefits must be monitored through evaluation designed to "justify training's existence." The temptation for corporate management to look across their organizations in tough times asking questions in terms of dollars (e.g., Return on Investment, or ROI) can be overwhelming. In response, the training evaluation literature contains many efforts to prepare training professionals to do exactly this, that is, calculate the ROI of training (Abernathy, 1999; Benabou , 1996; Cohen, 1995; Cook & Panza, 1987; Ensher & Murphy, 1997; Fitz-enz, 1988; Geber, 1995; Head, 1993; Lombardo, 1989; Medsker & Roberts, 1992; Phillips, 1994, 1996a, b; Rupp, 1992; Tesoro, 1998). Further, while many have recognized the futility of trying to obtain a hard-linked, isolated cause and effect type, analysis of training's ROI, its legacy has been an even larger set of quasi or implied

ROI methods, techniques, approaches, and the like. These are all aimed at describing training's results in various alternate ways to convince management (as a stakeholder group separate from the evaluators) of its positive "return" (ASTD, 1975; 1988; 1991; AT&T, 1995; Bassi & McMurrer, 1998; Gordon, 1987; Sorensen, 1995).

The quality movement is a second reason for training evaluation interest. There are at least two distinct dimensions to be considered here. The first involves a push to apply the principles of continuous improvement to training. While not necessarily fixated on ROI or the "bottom line" (although this theme seems not too far off in the background) efforts here are focused on making training development and delivery more effective. Representative among these are Mouton and Blake (1984), Quick (1991), and Powers (1992).

The second aspect of the quality movement's influence on training evaluation is the widespread adoption of quality standards by many organizations. Quality standards such as the ISO (International Standards Organization) 9000 series, and other quality benchmark models such as the Malcolm Baldrige award (see, e.g., Brown, 1997; Fisher, 1994) specifically call for the evaluation and continuous improvement of training. Seeking to have their organizations certified or otherwise recognized as a "quality organization" via such benchmarking standards, upper management and training professional commonly see statements such as the following:

> Training should be considered which will provide executive management with an understanding of the quality system together with the tools and techniques needed for full executive management participation in the operation of the system.

> Executive management should also understand the criteria available to evaluate the effectiveness of the system [ISO9004, 18.1.2; in Arnold (1994)]

Moseley and Solomon (1997) summarize the influence of quality system standards as follows:

> Implementation of ISO (International Standards Organization) Standards are fast becoming the "price of admission" to compete in global markets and certification will soon become a requirement. As the quality movement meets the information age, performance improvement efforts will meet a new set of challenges. Increasing demands for accountability will influence the theory and practice of evaluation. (p. 13)

These authors made this statement in connection with their discussion of "confirmative evaluation" applied to instructional design. In so doing, they further emphasized that confirmative evaluation is grounded in the current literature of continuous improvement and evaluation. This view further reinforces the notion of the quality movement's influence on training.

The two influences mentioned above (investment justification and the quality movement) both combined and individually have spawned an unprecedented flurry of professional media (books, articles, newsletters, training workshops/seminars, and even web sites, and computer-based tools) aimed at equipping trainers and HRD professionals with information and techniques required to "answer the call" for the increased evaluation of corporate training. As individuals or groups generally focused on the development and delivery of training as a product or service within a client organization, many training and HRD professionals do not have an extensive (or even rudimentary)

knowledge of evaluation. Although a good range of theory and research on training evaluation does exist, most practitioners are likely to be familiar with only a narrow band of such work. Furthermore their theoretical perspective of training evaluation is commonly centered on Kirkpatrick's "four level model." The next section demonstrates how the literature supports this conclusion of limited use by professionals, while also offering a review of some alternative theory and research.

Theoretical and Empirical Work

Several theoretically-oriented and empirically-based works have had varying degrees of influence on the professional practice of training evaluation in business and industry. Most theoretical notions of training evaluation, however, can be directly or indirectly traced back to Kirkpatrick's four levels of training results first published in 1959 (see also, 1994; 1996). In fact, the "Kirkpatrick Model" has had a profound and pervasive influence on the theory, practice, and research associated with training evaluation. In brief, the four levels describe the results of training in terms of training participant (1) Reaction (Did they like it?), (2) Learning (Did they learn it?), (3) Behavior (Did they use it?), and (4) Results (Did the organization or business benefit from new knowledge and skills resulting from training?). Because each level of result is increasingly more difficult to assess, with reaction being the easiest, as evidenced by the ubiquitous end-of-course survey or so-called "smile sheet" used throughout the training world, most training never gets evaluated beyond reaction (level 1). This is unfortunate, for even if we are able to confidently say that training participants liked (or didn't like) their training, it could have been a big waste of time and money in terms of producing intended results. This has been illustrated by Dixon (1987) who described several such

problems concerning the validity of "smile sheet" data. These involve problems associated with self-report data from participants obtained immediately after a training event regarding their views of the usefulness of the training before they have had a chance to apply it in the actual job context. While data concerning "Level 2" and "Level 3" training outcomes involve progressively more sophisticated, but fairly well-documented, measures respectively involving testing (see, e.g., Popham, 1990; Shrock, 1997; Shrock & Coscarelli, 1989; Worthen, Borg, & Gall, 1993) and job performance (see e.g., Dean, 1994; Gilbert & Gilbert, 1994; Rossett, 1992), measuring "Level 4" training results is substantially more complex and difficult.

In his original description of "Level 4 Results" Kirkpatrick did recognize the difficulty of measuring such:

> The objectives of most training programs can be stated in terms of the desired results, such as reduced costs, higher quality, increased production, and lower rates of employee turnover and absenteeism. It's best to evaluate training programs directly in terms of desired results. But complicating factors can make it difficult, if not impossible, to evaluate certain kinds of programs in terms of results.

He further explained a reference he used to develop his "Level 4" notion of training results:

> In a sophisticated article in the March/April 1958 issue of the Harvard Business Review, Rensis Likert says that changes in productivity can be measured on a before-and-after basis. A group of supervisors was trained in using democratic leadership in which decision making involved the use of a participative technique. Another group of supervisors was trained to make their own decisions and not to

ask subordinates for suggestions. Such factors as productivity, loyalty, attitudes, interest, and work involvement were measured. Both training programs resulted in positive changes in productivity. But the participative approach resulted in better feelings, attitudes, and other human relations factors. Likert concludes, "Industry needs more adequate measures of organizational performance than it is now getting." (excerpts from 1959 article, reproduced 1996, p. 59)

So, while suggesting accountancy-oriented measures of productivity and cost, Kirkpatrick's original notion of results is clearly derived from Likert's "modified theory" emphasizing the human organization—rather than the traditional, financial bottom line—as discussed earlier. But as discussed, most of the professional training evaluation literature that has referenced Kirkpatrick's fourth level has tended to emphasize training results in terms of what Likert described as "traditional theory" in his original article. Likert defined traditional theory by stating the following:

> The traditional theory of management is based on scientific management, cost accounting and related developments, and general administrative concepts taken from military organizational theory. (p. 319)

Furthermore, based on the results of his study (which compared "participative" and "hierarchically controlled" training approaches) Likert stated:

> As was demonstrated in the hierarchically controlled program of the experiment, putting pressure on a well-established organization to produce can yield substantial and immediate increases in productivity. This increase is obtained, however, at a cost to the human assets of the organization....In other words, the quality of the human organization deteriorated as a functioning social

> system....some of the increased productivity was achieved actually by liquidating part of the investment which the company had in the human organization in these divisions. The increase in productivity should have been charged with this cost. (p. 329)

Herein lies the major conundrum of "Level 4" training evaluation as commonly understood by training evaluators today: The organizational "results" originally outlined by Kirkpatrick (as developed from Likert's work published the previous year) were developed based on *modified* versus *traditional* administrative theory. Modified theory emphasizes human and intellectual versus accounting and economic organizational capital. Likert presented each of these theoretical positions as largely antithetical to each other. Yet as discussed (perhaps because of Kirkpatrick's brief reference to "reduced costs" and "increased production") *the legacy of the four-level taxonomy has been a continuing succession of professional practice largely fixated on evaluating training using the same "traditional" theory Likert cautioned against!*

Despite this anomaly, Kirkpatrick's four-level model has endured for nearly 40 years now. Why? A possible reason is that it lends itself well to popular corporate training evaluation practice being ostensibly understandable and conceptually straight-forward. No matter what the exact nature of its appeal and influence this four-level taxonomy is alive and well today and deeply ingrained in the collective psyche of training professionals. This influence has even spread beyond training to other areas such as technical communications products and services. In connection with this adaptation, Carliner (1997) expressed the following view regarding the longevity of Kirkpatrick's model:

> One of the Kirkpatrick model's many advantages is its wide use. According to *Training* magazine's annual industry survey, nearly all organizations conduct some of the model's level of evaluation (*Training*, 1995). That means trainers have a common language. In fact, so many human performance technologists use and understand this model that we refer to it in short-hand: Level 1, Level 2, Level 3, and Level 4. These levels provide not only a common language, but a common tool that lets us compare results much like price-to-earnings ratios let businesspeople compare performance among otherwise unlike companies. (p. 14)

Other authors have further proposed continued use of the model in a modified form to accommodate, for example, technology-based training:

> Training traditionally has been evaluated using Donald Kirkpatrick's four-level model. This model, introduced in 1959, has been widely used in both education and industry, but the increasing acceptance of technology-based training in industry may require us to take a new look at our methods of evaluation. (Lachenmaier & Moor, 1997; p. 16)

This comment seems to both endorse and tacitly question the four level model's continued relevancy.

Several authors and researchers have more emphatically and explicitly questioned the assumptions of the model (Alliger & Janak, 1989; Kaufman, Keller, & Watkins, 1996; Lewis, 1996; McLinden, 1995). Central to many critiques of level four evaluation is the issue of isolating and substantiating (proving) cause-effect between training and organizational results and performance. Bernthal (1995) explicitly discussed five critical assumptions about training evaluation in relation to the Kirkpatrick model. The first of

these has to do with the assumption that training evaluations are definitive. This assumption is based on the philosophy that a single study can answer all questions about the effect of a training effort. However, Bernthal noted that most evaluators are not prepared for ambiguous findings and that the degree of certainty regarding the results depends on such variables as the reliability of the design, measures, and sampling strategy. Bernthal's second assumption revolves around a belief among trainers that evaluation equals effectiveness. Yet he noted that evaluation focuses on the learning aspect of training. According to Bernthal, training evaluation answers the question, "Have the requisite skills and knowledge appeared as a result of training?" An evaluation can become problematic when it also tries to measure effectiveness. Effectiveness focuses on whether the training has produced the intended outcomes. To answer the effectiveness question, the evaluator must measure several organizational, individual, and training-related variables. Bernthal stated that "Evaluation and effectiveness are linked...But they shouldn't necessarily be arranged on a continuum, as they are in Kirkpatrick's model." (p. 42) A third (key) assumption discussed deals with the notion that trainers are accountable for effectiveness. The problem here is that many trainers who conduct evaluations don't have the skills, time or resources to do an in-depth study. They may not be knowledgeable about the training topic. It doesn't make sense for trainers to be held responsible for the success of all training especially those instituted by senior management. According to Bernthal, "Still, trainers often have the most to lose when results aren't positive." (p. 42) The fourth assumption is that level four evaluation is superior:

> Typically, trainers believe that level 4 is the pinnacle of training evaluation. But each level can provide equally valuable information, depending on the type of trainees being evaluated. Level 1 or 2 outcomes can provide some of the most useful information because those outcomes are often the easiest to measure and change. (p. 42)

The fifth and final assumption described by Bernthal has to do with the idea that measurement must occur in the first place. However, many measures used to assess training are inappropriate and not sensitive enough to detect behavioral changes in trainees. Bernthal further noted that "It's also difficult to know what questions to ask, how to phrase them...And all measurement methods aren't equally reliable or valid." (p. 42)

Bernthal's critique is representative of others. For example, in relation to the focus of the Kirkpatrick model, Brinkerhoff and Gill (1994) pay tribute to, but move quickly beyond it: "While a significant contribution to the HRD field, Kirkpatrick's model has kept the focus on the event, not the process...We must create ways to measure the entire training process and the effects of its various components." (p. 153) And, Kirkpatrick (1996) himself has acknowledged such concerns: "The benefits from training may outweigh the costs, but unfortunately, proof can be difficult, if not impossible, to get." (p. 56-57) In sum, no review of training evaluation literature would be complete without a recognition and consideration of the Kirkpatrick model's pandemic influence across the domains of training evaluation theory, research, and practice. Indeed, while other theoretically-oriented approaches toward training evaluation have been developed, as

noted, many can be related to some dimension of Kirkpatrick's model. A brief review of several other training evaluation approaches follows.

In considering the costs, benefits, and productivity of training, Kearsley (1982) applied quantitative (econometric) techniques in describing four kinds of cost/benefit models. These include, (1) the resource requirements model, (2) the life cycle model, (3) the benefits analysis model, or (4) the productivity model for analysis of training return. Such methods tend to rely heavily on a broad range of critical assumptions (stated and unstated) in applying quantitative indicators to produce numerical estimates of training's impact.

In contrast to strictly econometric or quantitative models, other authors have outlined alternatives to an exclusively numerical approach. Through the use of "soft systems" and "action systems" for the analysis of human activity, McDonald (1987) proposed the use of a causal map to conceptualize a training design and evaluation system. However, even given its qualitative orientation, this approach still highlights training's relation to productivity and corporate profitability. In determining criteria for training effectiveness, McDonald stated:

> As an outcome of the training program, the work performance of persons trained is enhanced, affecting the productivity of action-systems in the client organization, and ultimately the contribution of that organization to corporate profitability. Therefore, a major criterion of training effectiveness is the value added to the client organization's corporate contribution by the actual application on the job of what is learned through the training program. An action-system model of the client

organization's goals for training provides a heuristic for defining specific changes as criteria of training program effectiveness. (p. 27)

This view implicates both behavioral and organization-level results specifically in terms of knowledge application on the job, and productivity and profitability in the organization without being specific about the details, process, and mechanisms by which these results can be achieved through training.

In contrast to training evaluation models that focus predominantly on organizational results in terms of productivity and profitability, others have emphasized job-application of skills (Morrisey & Wellstead, 1975) or the overall process related to training. Brinkerhoff (1987) suggested paying much closer attention to the before and after of training development in discussing his Six-Stage Model for corporate training development and impact. This cyclical model considers the training process from needs assessment through development and delivery to evaluation and encourages the application of learning through each cycle of the process to improve subsequent iterations of the process. In addition to rendering training more amenable to organizational learning, a basic message here is simply to spend the time and resources to understand and document the purpose of training as a means to an end before its development. Next, follow-up to understand training's results in terms of its contribution to achieving these ends. With the right before and after work done properly, course development and delivery activities are set into a more balanced perspective within an overall process. Brinkerhoff argues that both the before and after work have suffered by receiving disproportionately little attention compared with the actual development and implementation of the training intervention. This argument seems reasonable given the

abundance of literature focused on the development and delivery phases of training (see, e.g., Powers, 1992; Quick, 1991; Rothwell & Kazanas, 1992).

Perhaps because the earlier empirical work has tended to focus on a few very specific areas, as implied above, many theoretically-oriented conceptualizations have not typically referenced the empirical literature on training evaluation. Another possible for the lack of synthesis between theoretical and empirical work is the lack of appropriate empirical studies to draw upon. This dearth of empirical work has been expressed by some of the earlier researchers. Hand and Slocum (1972), for example, performed a longitudinal study of the effects of a human relations training program on managerial effectiveness, but noted:

> Buchanan's (1970) review of the literature indicates a general lack of carefully controlled research design and a paucity of definitive studies relating training in human relations to any form of increased organizational effectiveness. (p. 412)

Using control and experimental groups, these authors empirically studied whether managerial human relations training could change attitudes and whether these attitudinal changes were reflected in organizational effectiveness. They found significant attitudinal and performance changes in the experimental group relative to the control group. The experimental group developed a more positive attitude toward the human relations aspect of their jobs, and this attitude was reflected in positive changes in job performance. Moitra (1976) employed empirical methods to develop a pre-program evaluation model to determine training effectiveness based on expectancy theory of work motivation. This author used expectancy theory as a framework that recognized the importance of motivation in the training process to develop three dependent variable measures of trainee

performance. These were based upon self-report measures of performance improvement by trainees, and two supervisor reported measures 4, and 8 weeks, after training completion. The conclusions supported the hypothesis that motivation alone was found to be the most consistent, significant, and valuable predictor of training effectiveness. Based again on an observation of the relatively meager amount of empirical research available, Hicks (1983) investigated the process of training program entry from the participant's perspective. This researcher found that participants who received a "realistic" preview of a training intervention's content were more motivated to learn compared to participants who received an overstated "traditional" announcement. The conclusions drawn supported that, instead of having some administrative rule requiring that employees take a particular course based on their job titles, departmental function, or supervisor's recommendations, attempts should be made to have employees believe there is a need to engage in a given training intervention.

Noe (1986) investigated motivational and environmental influences on training effectiveness. This investigator derived a model of multiple motivational influences in trainees relative to multiple measures of effectiveness referencing Kirkpatrick's model. The multiple influences included factors such as reaction to skill assessment feedback, locus of control, expectancies and self-efficacy, career and job attitudes, social and task environmental favorability, motivation to learn, and motivation to transfer. The results of this synthesis emphasized the importance of social reinforcement of newly acquired knowledge from co-workers, and supervisory personnel. An empirical extension of this work was further performed by Noe and Schmitt (1986). These researchers tested the model developed by Noe in an empirical study to investigate the influence of trainee

attitudes on training effectiveness. Using attitudinal response measures, scales were constructed and subjected to path analysis, the conclusion being that job involvement and career planning are antecedents of learning and behavior change relative to training.

Extending previous work begun by Hicks (discussed above), Hicks and Klimoski (1987) described a field experiment investigating the conditions of entry into training programs and its effects on training outcomes. These authors reported that multivariate tests for main effects were significant but the interaction of degree of choice and type of prior information available to trainees was not significant. Specifically, trainees who received realistic (as opposed to exaggerated) training previews and those who had a high degree of choice were more likely to believe the workshop was appropriate for them to take and they were better able to benefit from training.

While beyond the scope of the present review, it should be noted that several authors have focused on training transfer which is defined as a behaviorial change on the job as a result of training. Training transfer has been critiqued by several authors (see above) as too restrictive in heavily knowledge-based settings where job behaviors are not readily observable; however, a discussion of some of the central principles and work related to transfer is included here for completeness.

According to Camp, Blanchard, and Huszczo (1986) knowledge acquired through training has the potential for positive, negative, or zero transfer. Zero transfer occurs when the material in training cannot be related to the cues that exist in the job environment. Negative transfer occurs when the material learned results in a decrease in job performance (e.g., when it interferes with previously learned job behaviors that were acceptable). Principles for optimizing positive transfer are derived from two classical

approaches to transfer of learning problems.[5] These are (1) the identical elements approach and (2) the transfer through principles approach. The first approach stipulates that identical elements in the training and job situations must exist for positive transfer to occur. The second approach proposes that positive transfer occurs through cues that stimulate the recall of general principles or guidelines for behavior.

In discussing post-training strategies for facilitating positive transfer (see also, Kelly, 1982), Wexley and Baldwin (1986) pointed to the empirical inadequacies associated with post-training transfer:

> It is clear from a review of the literature on transfer that most current authors, regardless of what particular posttraining [sic] strategy they espouse, support McGehee and Thayer's suggestion that additional training directly addressing the transition from "learning to doing" (1961: 177) best enhances transfer of learning. To date, most of the literature on posttraining transfer interventions has been conceptual rather than empirical. (p. 506)

Although these authors noted a dearth of empirical work specifically connected to post-training transfer as they defined it, a fairly substantial body of empirical work exists describing various other aspects of transfer. For example, Baldwin and Ford (1988) specifically reviewed 70 empirical studies in the three areas of training design (38 studies), trainee characteristics (25 studies), and work environment (7 studies). Also, Gist, Bavetta, and Stevens (1990) empirically investigated the influence of transfer training methods on skill generalization, repetition, and performance level. And, while not reporting the results of original research, several authors have used the results of such

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[5] Bass and Vaughn (1966); Leifer and Newstrom (1980) as cited in Camp, Blanchard, and Huszczo (1986)

studies to discuss evaluation improvement. Citing a range of empirical work, Barnow (1986) provided a good overview of existing methods and problems involved with the evaluation of federally funded employment and training programs in the United States.

In defining a two-dimensional "role-time training transfer matrix" as a conceptual aid to developing positive transfer strategies, Broad and Newstrom (1992) specifically defined three major organizational stakeholder group roles to consist of managers, trainees, and trainers. They further focused on three specific time periods as before, during, and after in relation to the training event. In constructing a three-by-three matrix, using these roles and time periods, these authors used a panel of experts to populate the nine resulting cells with stakeholder perceptions related to effective transfer strategies.

More recent transfer work has continued to focus on assessments of skills and performance in trainees. For example, in using a longitudinal field study to study the relationship of information system training methods and cognitive ability to end-user satisfaction, comprehension, and skill transfer, Simon, Grover, and Teng (1996) compared traditional and non-traditional techniques for computer training among U.S. Naval recruits. Traditional training techniques included lecture-based and independent study. Non-traditional techniques involved behavior-modeling as an enhanced combination of both of the traditional techniques. Based on measures of hands-on task performance, and end-user satisfaction, the use of hands-on methods, especially behavior modeling resulted in superior retention of knowledge, transfer of learning, and end-user satisfaction.

Other researchers have focused on the development of quantitative methods and models to describe training ROI. Using a multi-attribute utility technology (MAUT),

Milatzo (1989) evaluated a standard window clerk training program for the U.S. Postal Service. Through a seven-step process including program and stakeholder identification, attribute definition and weighting, expert ratings, and utility score production, Milatzo used MAUT to estimate that a new window clerk program had a 94% greater utility than that of a previous program.

While the bulk of empirical training studies have employed strictly quantitative measures and analytical methods, several researchers have begun to explore and describe the results of training with qualitative approaches. This seems to be more a trend in the later empirical research. For example, Shayo and Olfman (1993) used qualitative research methods to explore the views of end-users with respect to the most recent formal software training session they attended. Using concepts from theories of self-regulation to generate questions and propositions to guide their analysis, these researchers focused on the areas of goals and intentions, self-efficacy, expectancy, individual characteristics, feedback, and support relative to their investigation of software training effectiveness. They found that the success of the training process seemed to be influenced by the quality of match between trainee pre-training goals and trainer goals. When there was a mismatch, the trainees usually did not adopt the software or had to be retrained.

Other qualitative training evaluation research also merits mention. Sacks (1994) analyzed software developer knowledge and skill development using ethnomethodology.[6] Specifically he used interviewing techniques in a single case study involving one company. In doing this he focused on the questions concerned with how software designers and programmers interact with learning systems in terms of the range and

usefulness of techniques, order of application, organizational culture, and workplace design among others. Thirty-three audio taped interviews were carried out. These were transcribed and coded in the grounded theory tradition of Glaser and Strauss (1967, cited in Sacks). Sacks noted:

> As in grounded theory, my work derived its insights from the data themselves and was refined as more interviews fleshed out a model of disconfirmed early hypotheses. However, I made no attempt to account for the totality of all experience involved in learning. In this work I can only take the data as far as they apply to a limited sample of computer professionals and must leave broader generalization to future research. (p. 15)

This work is interesting in that it adapted an ethnomethodological approach in a non-traditional setting. Several findings discussed include the influences of environment (business, job, culture), formal versus informal thinking, written materials, people as resources, and models of learning (field independence/dependence, depth of processing, inventory of learning processes, the experiential learning model, models and reality).

Empirical studies examining stakeholder variation in training evaluation are extremely few. In the only such study found for this review (a qualitative study entitled "How managers and training professionals attribute causality for results") Brown (1994) used coded text analysis and a software program called "The Ethnograph" (Seidel, Kjolseth, & Seymore, 1988) to reveal differences in the way managers and training professionals attributed causality for organizational results relative to training.

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[6] Adler and Adler (1994) describe ethnomethodology as an observational research technique involving, for example, conversation analysis and focusing on how people accomplish their everyday lives.

Focusing on two specific stakeholder groups—training professionals and functional line managers—Brown (1994) found that training professionals differed from managers in that they referred to use of data from surveys, focus groups, and course evaluation instruments, and to information collected through conversation with other training professionals, as sources of information when making causal judgments. Managers did not. Training professionals reported training as a cause of the positive results they observed while managers generally did not. Training professionals were aware of processes, but often had incomplete knowledge of results, while managers had direct knowledge of results in their own departments, but incomplete knowledge of what results had been achieved in other parts of their organization.

Brown also noted Kirkpatrick's model but further highlighted the problems involved with evaluating training in terms of economic organizational results by noting that causality for events within complex contexts is extremely difficult to measure. He recognized that training professionals know intuitively that under some circumstances training can increase efficiency and profits, but realistically, training alone can almost never determine profit or loss. Training is just one of many interrelated factors.
In describing his results Brown wrote:

> The findings of this study suggest that the cause-effect relationships encountered by business professionals are very complex, often with many factors acting as causal inputs which led to mixed results. Training evaluators described attempts to isolate a single factor (training) then link that factor causally to the desired results. An often repeated goal of evaluators is to collect data about the merit and worth of inputs in support of a decision making process. With this goal in mind,

> perhaps a better use of the data collection and analysis skills possessed by competent training evaluators would be to explore a range of important causal inputs, attempting to provide more complete information to improve the accuracy of managers' causal judgment making activities. It is recommended that managers use the skills of evaluators to better effect by asking them to explore a wider range of questions. (p. 144)

Such results serve to both substantiate and tie together a range of conceptual work describing training evaluation in business organizations. For example, Swanson (1989) noted that most typically upper-level managers are concerned on a daily basis with a great variety of key or strategic organizational decisions, as such they are forced to evaluate continually:

> Business decision makers—typically, people with titles of manager, director, vice-president, or CEO—are charged with making all kinds of decisions that contribute to the fundamental economic missions of their firms. They evaluate continually and make decisions based on their evaluations. (p. 72)

Moreover, in contrast to the perceptions of training professionals and training evaluators regarding training's potential impact at the organization-level, managers tend not to view and value the corporate training function similar to other perceived "hard" investments:

> Managers in organizations tend to lack commitment to the education of employees. They do not value training and development because they do not view educational activities on a par with corporate investments that bring significant returns to the business. (Gill, 1989 p. 42)

Also, attempts to tightly focus and control empirical investigations to reveal (even some aspect of) the organizational benefits of training have been shown to suffer from cause-effect problems, as well as, problems of low utility for decision makers. In commenting on user-focused evaluation applied to corporate training Brethower (1989) stated:

> No manager will pay attention to the information or make use of the information unless he or she has had input in asking the question in the first place, in collecting the information, and in interpreting the meaning of the information. Therefore, the idea underlying user-focused evaluation is that those people who will be called on to implement the findings of the evaluation should be involved in the evaluation itself (p. 37)

This passage suggests an underrepresentation of management as a stakeholder in corporate training evaluation. These comments also reflect Brethower's recognition of "user-focused evaluation". Discussed more later in this review, training evaluation involving multiple perspectives, such as stakeholder-based evaluation, do tend to broaden the relevance of and opportunity for increased usability of evaluation results.

The literature reviewed thus far suggests that even carefully prepared program-level evaluations of education and training might seem to figure very slightly in the overall system-level concerns of managers as training program sponsors. Yet some have further suggested that by necessity (particularly in organizational environments where innovation is rewarded) program-level training is being subjected to more rigorous and multiple-perspective forms of evaluation (Bragg, 1995). Whereas evaluators and researchers of the past industrial era might have "succeeded" in reducing the transfer of complex responses to mechanistically observable job behaviors and attributing these, in a cause-

effect manner, to a training/learning event (see, e.g. Rae, 1986) in the name of training effectiveness, this approach has largely outlived its usefulness.

Brinkerhoff (1995) would seem to agree based on his comments to the *American Society for Training and Development* (ASTD, 1995). The crux of his message was that, by adopting a systems view in which training is considered as essential to the overall system (as other resources that typically go unevaluated such as the need for interior lights in offices), stakeholders would tend to relax their requirements for training to constantly prove its worth in the organization. In effect the need for the evaluation "event" disappears as a common understanding is developed among stakeholders (e.g., training program sponsors, providers, and participants) regarding the training imperative. Given the context and shared understanding of the situation, training just makes sense and needs not be formally evaluated (just as the office light level does not need to be formally evaluated). While this view makes good sense, it also assumes a solid foundation of mutual trust and communication among stakeholders. Until funding sponsors cease requesting evaluative proof of training's results, and until training professionals cease trying to supply such proof to justify their programs (whether it is requested by sponsors or not), Brinkerhoff's view will remain more idealistic rather than realistic. His point is well taken, however.

In a workshop on concept mapping held in Chicago in 1996, Bill Trochim (the workshop facilitator) asked an impromptu question regarding the calculation of training ROI. When pressed by one of the workshop participants about using the concept system to support such calculations, Trochim asked if those fixated on training ROI had ever

considered "the ROI of calculating training ROI." Such a question captures the essence of Brinkerhoff's argument (outlined above).

But to completely abandon ROI thinking in relation to training suggests the need for a dynamic interplay and open dialog between stakeholder groups involved in training. From a theoretical perspective this notion might be compared to what Huberman (1994) described as "sustained interactivity" between researchers and research users. Although he was not referring to training sustained interactivity can be adapted to accommodate such if researchers are viewed as analogous to evaluators, and research users are viewed as analogous to training program sponsors. Huberman adopted a decidedly stakeholder-based orientation in conceptualizing researchers and practitioners as two distinctive and separate groups:

> Conceptually, there is something on the line for both sides, and this is what keeps them talking. Whatever understandings they generate constitute a sense-making and interpretive exercise on both sides. Also, we are in a situation of relative symmetry, in which the researchers are no longer delivering their knowledge base to practitioners and leaving the scene, but in which both sides are laying claims to conceptual power and replicability as the findings play out in their local surround. If basic cognitive theory tells us one thing, it is that symmetry is often a prerequisite to significant learning, especially among adults. (p. 23)

This same reasoning seems to apply equally well to evaluators and non-evaluators regarding the evaluation of training in an organizational context. Huberman's description offers a basis for resolving training evaluation issues (identified above) and suggests a joint construction of evaluation criteria to increase the usefulness of results for users. A

common theme is that training evaluation results become more useful when they are produced in the language most meaningful to the program stakeholders. This leads to the tentative conclusion that, what the "ideal evaluation model" turns out to be cannot be known without substantial input from the program sponsors who are also ultimately responsible for the organization and its effectiveness.

Training evaluation power and politics.

In discussing barriers to implementing training programs, the Conference Board, Inc. (1997, p. 20) explicitly mentioned the hierarchically "low-power position" of most corporate human resource groups and organizational "power and politics" as specific impediments. While empirical studies specifically targeting training evaluation power and politics are particularly rare, several studies address the topic with varying degrees of directness. For example, beyond the empirical findings described by Brown (1994) discussed earlier, by far the most explicit discussion of power and politics in training evaluation was provided by Darrah (1995). He presented and discussed the implications of empirical findings based on a qualitative case study performed in a computer manufacturing firm. Because of the organizational context similarities (high technology business) this discussion is particularly relevant to the present study.

Darrah studied the views and perspectives of multiple groups including production management, engineers (who were also recruited as instructors), and production workers in relation to training originally conceived to improve the technical and quality aspects of a computer manufacturing operation. Initially, Darrah acknowledged:

> Workplace training programs may serve multiple purposes and be subject to diverse assessments, but as instrumental activities they are the means by which the transfer of requisite skills and knowledge is achieved. For example, workers may judge a program on the basis of the quality of instruction and whether they are able to translate what they learned into better employment opportunities. From the perspective of the employer who sponsors it, however, workplace training may be assessed as successful insofar as it solves important problems within the organization. Thus, both workers and employers may evaluate programs according to how efficiently the transmission of skills and knowledge occurs, and how the skills and knowledge that are transmitted are relevant to their respective goals of career building or solving perceived workplace problems. Following this reasoning, it is the output of training that matters; a training program can therefore be conceptualized as a conduit through which skills and knowledge is transmitted. (p. 31)

However, Darrah adopted an alternative analysis by situating training within a larger culture of learning in the workplace. In contrast to constituting a pedagogical (or andragogical, see Knowles, 1990) channel through which skills and knowledge flow, training in this analysis reflects and reifies extant social relationships in the workplace including those related to power relationships. In commenting on the differing perspectives involved, Darrah noted:

> Each group of participants had ideas about training that place it in the context of their larger assessments of the workplace, and they differed in their definitions of the problems that training was to solve....Training appeared to be a natural and

> obvious response to 'workmanship problems,' but the tacit assumptions made about the workplace and replicated through training included a prescriptive ideal that was abstracted from the daily practices of production workers: human agency was striking by its absence. The right of some parties to call for and then to define the transfer of specific knowledge and skills to another group is an act of power, a claim on time and resources that was considered to be a natural part of the organizational order....From its inception, therefore, the training class reflected ideas about work, agency, individuals, learning, and power that remained invisible to the participants who, despite their disagreements, saw training as the logical way to solve problems. (p. 35)

This "rational problem solving" approach is further described as a basis for organizational decision making that is "deeply embedded in a broadly western and specifically American world view." (p. 31). Problem solving has become the culturally acceptable way to frame situations in preparation for social action. Organizations must develop means to present themselves as rational actors in order to conform to societal norms, despite evidence to the contrary. In connection with this Darrah stated:

> By defining the goals of training as the solution to a set of predefined problems, the training planners utilized a widely accepted and familiar model for justifying action. Yet in doing so, important assumptions about organizational life, such as the exercise of power, the role of individual agency, and the definition of work remained implicit. The training program, as an exercise in organizational problem solving, provided opportunities to exercise and reproduce such tacit organizational assumptions. In this sense, the training program was as much

about enacting world views as it was about conveying skills and knowledge. This constitutive aspect of training has implications for how such programs are ultimately assessed. On the one hand, a training program may be deemed successful when in fact it merely conforms to an organizational world view. By confirming 'what everyone knows,' a training program can allow an organization to be more efficient in pursuing a course of action that is ultimately deleterious, while it simultaneously directs attention away from other conditions thought to be extraneous to problem solving. On the other hand a training program can fail for reasons unrelated to its instrumental function, but rather because the conditions underlying the problems it is intended to solve remain unchanged. Training may therefore constitute a seemingly neutral language for structuring 'messes' (Ackoff 1974), while it mystifies or conceals other organizational issues. (p. 35)

Darrah concluded that the differing perspectives regarding training, learning, and work "were embedded in differential power." (p. 40) The "sociocultural" view adopted by this researcher views organizations as "complex systems structured by technology, social organization, and ideology, which manifest themselves in the daily practice of work." (p. 40)

Perhaps the most direct opportunity to connect politics to training evaluation arises because training professionals are often cast as evaluators of their own training programs. Hence, they could well be expected to have a particularly keen or vested interest in the results of such evaluations. Unfortunately the implications of such vested interests or self-serving bias are virtually ignored in the general training evaluation literature. Unlike discussion in the organizational and program evaluation domains, both

empirical and conceptual work on the implications of organizational power relations specifically related to this perspective of training program evaluation are effectively nil. This is the case despite the existence of a solid theoretical basis to understand such power dynamics (e.g., Chelimsky, 1987; Kakabadse & Parker, 1984; Mintzberg, 1983; Pfeffer, 1981, 1992; Weiss, 1987). Although the present study does not specifically focus on such political uses (misuses) of training evaluation, as mentioned earlier such considerations do provide a useful framework component especially in conjunction with multiple-constituency perspectives.

The last main section of this review is a selective review of the program evaluation literature. While several authors have applied integrated principles of program and training evaluation the former body of knowledge still seems largely unconnected to training evaluation practice. Two main areas in which training evaluation could benefit from the program evaluation literature are the increased application of stakeholder-based approaches and the recognition of organizational power and politics.

Program Evaluation

In discussing a systems approach to attain highly effective training, Brinkerhoff and Gill (1994) mention that such an approach uses program evaluation as a tool for continuous improvement. This emphasizes a highly systemic and encompassing view of training within the context of an overall organizational system. Yet others have stressed program evaluation to support decision making and accountability (Stufflebeam & Webster, 1988). In contrast to a systemic view, the decision making model emphasizes that evaluation should assist decision making and be geared toward supporting accountability. This view emphasizes that evaluation has to be useful to those that it

intends to serve, for example, supporting the potential interests of training program sponsors: they want to make good decisions which provide a basis for improvement and accountability—or at very least, learn something potentially useful about their organization for future decisions. Either approach, however, involves the use of program evaluation which has associated with it certain purposes, processes, and consequences, and stakeholders. These aspects of program evaluation are considered next.

Purposes

The purpose of program evaluation can be described in terms of decision making, organizational effectiveness, program definition or improvement, and the determination of program merit and worth. Among the traditional purposes of evaluation, Stufflebeam and Webster (1988) include (1) decision making, (2) accountability, and (3) understanding as major aims. They emphasized that evaluation should assist decision making and be geared toward supporting accountability. According to Stufflebeam and Webster merit concerns program quality. Questions of program merit might be "Is the program a good one? Does it meet or exceed pertinent standards?" Program worth is concerned with whether the program accomplishes what it was intended to accomplish. An illustrative question of worth might be "Did the program meet a predetermined, high-priority need in a given setting? Questions both of merit and worth are, therefore, concerned with program judgment rather than improvement. This is a fundamental distinction.

Patton (1997) seems to recognize both judgment and improvement in his definition of program evaluation as "the systematic collection of information about the activities, characteristics, and outcomes of programs to make judgments about the

program, improve program effectiveness, and/or inform decisions about future programming" (p. 23). Posavac and Carey (1992) emphasized the role of program evaluation in organizational effectiveness in their statement that "Program evaluation can be a powerful tool for improving the effectiveness of organizations" (p. 11). These views illustrate central purposes of program evaluation in terms of judgment, improvement, and the effectiveness of the organization.

Refining the term "program" Scheirer (1994) distinguished between aggregate and targeted programs. Aggregate programs imply a funding classification for activities oriented around a global objective. Program evaluation for aggregate programs often focuses on monitoring participants and activities, then measuring outcomes, with little emphasis on methods for inferring whether the program caused the outcomes. As such, aggregate program theory tends to be more normative than causal in defining what the program should be. Hence, the use of aggregate (normative) program evaluation provides a useful alternative to circumvent, for example, the insistence on "proof" for organization-level program results since it de-emphasizes establishing causality for such outcomes (contrast this, for example, to "theory-based evaluation," Weiss, 1997).

The relationship between goals and evaluation has been described by several authors. Goal-free evaluation has been described as a situation in which "the evaluator is not told the purpose of the program but does the evaluation with the purpose of finding out what the program is actually doing" (Scriven, 1991b, p. 180). One of the benefits of goal-free evaluation is the avoidance of expensive, speculative, and time-consuming problems involved in determining "true" current program goals. While program goals

may seem either obvious, or easily obtained, others have similarly pointed out the problematic nature of performing evaluations strictly in terms of program goals:

> Focusing an evaluation on program goals and objectives is clearly not the straightforward, logical exercise depicted by the classical evaluation literature because decision making in the real world is not purely rational and logical. This is the paradox of goals. They are rational abstractions in nonrational systems. (Patton, 1997, p. 174)

This situation then effectively foreshadows politically-based interpretations of effectiveness. According to Pfeffer (1992) "Because organizations are inevitably confronted with multiple, occasionally competing objectives, the assessment of the effects of organizational choices is inherently ambiguous and uncertain" (p. 258). Indeed, among program staff, Patton (1997) even suggests avoiding the terms goals and objectives in favor of discussing desired outcome conceptualizations by asking questions such as (1) What are you trying to achieve with your clients? (2) If you are successful, how will your clients be different after the program than they were before? (3) What kinds of changes do you want to see in your clients? (4) When your program works as you want it to, how do clients behave differently? (5) What do they say differently? (6) What would I see in them that would tell me they are different?

Consequently, program "goals" might be better understood in terms of stakeholder expectations. For example, McLinden (1995) pointed out "What is needed is a theoretical focus that directs attention to both the goals of the intervention and to stakeholder expectations...The challenge for the HRD professional, then, is to define what constitutes proof among stakeholders and determine what level of methodological rigor is

required" (p. 7). This suggestion relates well to multiple-constituency notions of assessing training effectiveness and recognizes the need to respect organizational context (culture and ideology) in training program evaluation research.

The formative-summative taxonomy (Scriven, 1967, 1991a) has been widely used to guide research, facilitate communication, and develop knowledge over the past 30 years. Formative evaluation is generally understood to be that which is designed, done, and intended to support the process of improvement (development), while summative evaluation is the rest of evaluation intended to support conclusions for any reasons besides development. Without reiterating the details of lengthy discussions as to the viability of "formative" versus "summative" program evaluation, the results of such discussions have served to stimulate useful dialog related to evaluation theory. For example, in reconceptualizing the formative-summative debate, Patton (1996) introduced "developmental evaluation" (evaluators) to serve development-oriented programs that have as their purpose the vague, general notion of development:

> The process is the outcome. They eschew clear, specific and measurable goals up-front because clarity, specificity and measurability are limiting...The process often involves engaging participants in setting and achieving their own goals...They never expect to arrive at a steady state of programming because they're constantly tinkering as participants, conditions, learnings, and context change. (p. 135)

Beyond the formative-summative dichotomy Patton identifies valid purposes for evaluation that include "developing programs and organizations" and "creating learning organizations" (p. 142). Such views obviously recognize the complex nature of

evaluation in organizations and correspond well with emerging images of knowledge-based, intelligent, organizations.

Processes

Evaluation processes are concerned with the steps involved in actually carrying out the evaluation. This includes steps to plan, develop instruments, collect data, analyze data, interpret the analyses, report, and disseminate the findings. The "context, input, process, product" or CIPP evaluation model (Stufflebeam & Webster, 1988) is representative of more traditional approaches and includes process steps to administer and focus the evaluation, as well as collect, organize, analyze, and report information for decision making.

Alkin (1991) described evaluation as a process of information gathering for presentation in a useable form for decision making. He further noted that different kinds of decisions require different kinds of evaluation procedures and outlined four assumptions about evaluation. He stated that evaluation is (1) a process of information gathering, (2) useful to assist decisions about alternative courses of action, (3) presented for effective use by the decision maker, and (4) determined procedurally by the decision kind(s) required.

Several authors have discussed general and educational program evaluation processes. Posavac and Carey (1992), for example, discussed evaluation planning, criteria selection, measurement principles, ethical standards, dissemination, and utilization for program evaluation and monitoring. These authors further detailed nonexperimental and quasi-experimental quantitative evaluation approaches, in addition to qualitative and mixed (qualitative and quantitative) methods. In preparing evaluation

reports they suggest the use of techniques involving the development of a communication plan in terms of the stakeholders involved, and content of the formal written report. The report should be outlined and include a clear statement of purpose. It should describe the context, participants, criteria, data collection procedures, findings, recommendations, and possible bias involved with the evaluation.

Focusing on educational evaluation, Worthen and Sanders (1987) considered the role of evaluation for improvement. They described several specific approaches to evaluation including those oriented toward objectives, management, the consumer, expertise and adversary-oriented approaches. In terms of evaluation processes they provided practical guidelines for conducting and using evaluations. These involve guidelines to accommodate the political, ethical, and interpersonal aspects of evaluation, as well as data collection guidelines for information control, organization, and retrieval. They also suggest several methods for analyzing and interpreting both qualitative and quantitative data. Reporting is considered in terms of its purpose, audience, timing, and use.

Other authors have focused on more specialized evaluation process forms. In defining "fourth generation" evaluation as a form of evaluation in which the claims, concerns, and issues of stakeholders serve as organizational foci (the basis for determining what information is needed), that is implemented within the methodological precepts of the constructivist inquiry paradigm, Guba and Lincoln (1989) detailed a hermeneutic dialectic process involving stakeholder circles. The data analysis process involves the "constant comparative" method based on differing stakeholder interviews. According to Guba and Lincoln

> The process is repeated with new respondents being added until the information being received either becomes redundant of falls into two or more constructions that remain at odds in some way. (p. 152)

In contrast to evaluation processes based primarily on quantitative data and analysis, the processes outlined in connection with fourth generation evaluation invoke the constructivist paradigm and are situated within the domain of qualitative social research (see, e.g., Denzin & Lincoln, 1994).

Specifically referring to training, Caffarella (1988) identified a nine-step process for planning and conducting a systematic program evaluation. These include (1) identifying the individuals to be involved in planning and overseeing the evaluation, (2) defining precisely the purpose of the evaluation and how the results will be used, (3) specifying what will be judged and formulating the evaluation questions, (4) determining who will supply the necessary evidence, (5) specifying the evaluation design (e.g., single group posttest, pre/post test, time-series, control group) to be used, (6) determining the data collections techniques to be used (e.g., observation, interview, questionnaires, tests, trainee products, organizational records, cost-benefit analysis), (7) specifying the analysis procedures to be used, (8) specifying what criteria will be used to make judgments about the program, and (9) determining the time frame and the budget needed to conduct the evaluation. This author also provided suggestions for focusing the evaluation in terms of participant learning, job performance, organizational policy, and training policy. This overall process (while adapted for training program evaluation) is generally representative of a practical program evaluation approach describing evaluation processes

from planning through execution and reporting (see, e.g., Wholey, Hatray, & Newcomer, 1994).

In brief, evaluation processes are conceptually situated between and related to both the purpose(s) and consequences of evaluation. Methodologically, while there have been historic debates and differences between paradigms (worldviews built on implicit assumptions) Patton (1997) has noted that the field of evaluation has come to recognize that using multiple methods (quantitative and qualitative) can be valuable because each has its strengths and one approach can often overcome weaknesses of the other.

Consequences

The consequences of program evaluation include the utilization of evaluation results. Evaluation utilization and the broader area of knowledge utilization are closely related areas. According to Shulha and Cousins (1996) "scholars continue to think of the utilization of research findings or program knowledge in instrumental, conceptual, and symbolic terms" (p. 26). Based on an interdisciplinary review of 65 studies of the use of evaluation results Cousins and Leithwood (1986) developed a framework that considers evaluation utilization as "decision making" versus "education." This framework distinguishes (1) evaluation implementation, and (2) decision or policy setting as two higher-order categories of factors affecting use. The factors of evaluation quality, credibility, relevance, communication quality, findings, and timeliness are associated with the evaluation implementation. Information needs, decision characteristics, political climate, competing information, personal characteristics, and commitment/receptiveness are seen as part of the decision or policy setting. Among other conditions, overall evaluation use was most evident when evaluation findings were (1) consistent with user

beliefs and expectations, (2) users were involved in the evaluation process, and (3) users considered the data relevant to their problems. In summarizing, the authors stated "Results argue strongly for evaluation procedures that at the outset generate information helpful to users in carrying out their decisions" (p. 360). These results highlight some dimensions of utilization while recognizing the roles of program stakeholders and evaluation users.

User-focused evaluation (Alkin, Daillak, & White, 1979) is a sub category of decision-oriented evaluation that emphasizes the instrumental client application of evaluation results, for example, in decision making. The general area of evaluation geared toward use and the user has several related tenets and labels. Many of these can be related to Patton's (1997) framework of "utilization-focused evaluation". For example, in reference to "responsive evaluation", Stake (1975) advocated incorporating into an evaluation the various points of view of constituency groups under the assumption that each of the groups associated with a program understands and experiences it differently and has a valid perspective (Stecher & Davis, 1987, cited in Patton, 1997). According to Patton, utilization-focused evaluation is inherently participatory and collaborative in actively involving primary intended users in all aspects of the evaluation. But in the complex milieu of assessing organization-level results involving multiple goals and multiple actors, utilization-focused evaluation leaves questions unanswered. For evaluation users are also organizational stakeholders.

In recognizing the immediacy and specific potential users (who are likely to benefit form the results) of the evaluation, Alkin (1991) related evaluation utilization with the roles and relationships of the evaluator and the decision maker(s) or

stakeholder(s). The central ideas here are that the evaluator should engage decision makers to better understand their concerns and focus the evaluation on the concerns of a minimum number of decision makers/stakeholders to increase the effectiveness and potential use of the evaluation. Patton was on to much the same idea with his focus on "intended uses by intended users." And, Smith and Chircop (1989) further placed Patton's view in an apolitical arena of technical rationality driven by the goal oriented approach of purposive-rational action and the expert-client system. The ends (goals) of the evaluation are clear to evaluator and decision maker.

The most recent conceptions of utilization include two related areas described by Shulha and Cousins (1996) as process use and organizational learning. These emerging areas represent a significant development because they augment and extend prior conceptualizations of evaluation utilization described by the instrumental, conceptual, and symbolic modes described. Process use (see also Greene, 1988; Patton, 1997) refers to the impact of the evaluation process, not just its outcomes or results. For example, intended users (through their participation) learn about their programs and their learning ultimately affects their practices, decisions, and behaviors. These process effects can be described in terms of cognitive, affective, and political dimensions of the evaluation process. For example, research knowledge and skills are developed in participants as a result of their participation in the evaluation process. Process use can also include results related to enhanced communications, empowerment, social justice, and organizational development.

A related (but sufficiently distinctive) form of process use, involves consequences of evaluation in terms of organizational learning. By invoking organizational learning

principles in relation to participatory evaluation. Cousins and Earl (1992) implicitly proposed that conceptions of utilization be expanded to consider the effects that transcend the boundaries of the program under study to include the organization within which the program is being implemented. This notion relies on several key organizational learning principles. These include (1) that knowledge is socially constructed, (2) that learning occurs first at the level of the individual, then at the collective level, (3) that collective learning can be either incremental "single-loop" versus "double-loop" learning (Argyris and Schön, 1978) which serves to shift fundamental assumptions about organizational practice, and (4) that learning can be either conceptual as the shared representation, or behavioral as evidenced by overt actions.

While several authors have developed the link between organizational learning and evaluation (Jenlink, 1994; Preskill, 1994) some of the most recent empirical work has focused on specific areas such as the organizational effects of internal participatory evaluation. Robinson (1997) observed varying increases in seven indicator variables for organizational learning attributable to the evaluation process. These included (1) shared knowledge representation, (2) levels of learning, (3) memory, (4) knowledge of action, (5) knowledge acquisition, (6) knowledge generation, and (7) interpretive systems. He produced evidence to show that the four dimensions of process use described (cognitive, affective, political, organizational) were influenced by internal participatory evaluation.

In sum then, the introduction of process use has expanded and augmented our view of evaluation utilization. The idea of process use effectively broadens the concept of evaluation utilization. Whereas traditional evaluation conceptualizations tended to isolate utilization effects to the tail end of the overall process (e.g., use of published

report findings for decision making), the process use view accommodates notions of use throughout the duration of the evaluation—from planning through to reporting. Such use can be described in terms of cognitive, affective, political, and organizational development and learning dimensions. The idea of process use also recognizes a wider audience and involvement (beyond, for example, a singular decision maker) of participants and stakeholders in evaluation. Yet the roles and nature of stakeholder involvement in evaluation has been steadily emerging as an area of study itself. For the purposes of the present study this topic deserves special mention as presented next.

Stakeholders

Stakeholder-based evaluation (Alkin, Hofstetter, & Ai, 1998; Bryk, 1983) is an approach that identifies and is informed by particular individuals or groups. Stakeholders are the distinct groups interested in the results of an evaluation, either because they are directly affected by (or involved in) program activities, or because they must make a decision about the program or about a similar program (Gold, 1983; Stake, 1983). Alkin (1991) has distinguished four different stakeholder roles. These include stakeholders as (1) primary users of evaluation results, (2) information sources for framing the evaluation, (3) data sources during the evaluation, and (4) the audience for the evaluation report.

Multiple-constituency and competing values approaches to effectiveness assessment support broadening user involvement in program evaluation. Gill (1989) proposed the adoption of user-focused evaluation for corporate training to increase evaluation responsiveness and utility for managerial decision making. Rather than have training evaluation remain the responsibility of training professionals, increased

management involvement is prescribed (see also, Nadler, 1984). While such participation can increase utilization (Cousins & Earl, 1992), Brown (1994) found substantive differences between how managers and trainers attribute causality for organizational results: "...training professionals often identified training as either the sole cause or a primary cause of the results that had been achieved. Managers rarely singled out training as a cause of results" (p. 149). McLinden (1995) suggests that this situation can be improved by broadening the focus to recognize and distinguish between proof, evidence, and complexity to understand the impact of training in an organization. Research on stakeholder variation is seen to be a prerequisite to developing such an understanding particularly in large or complex training-intensive organizations.

Power and politics.

As noted discussion of power and politics in training evaluation is effectively nil. Several searches of the *University of Ottawa* database *Polaris* (polaris.uottawa.ca) using "training evaluation and politics" included all social, psychological, educational (*SocioFile, PsycInfo, ERIC*), and *Current Contents* resources available producing a negligible number of useful "hits." The most recent search included the following four major databases: (1) *current contents* (week 01, 1996 through week 41, 1998) which provides access to the tables of contents of more than 3,800 international journals covering all disciplines; (2) *ERIC* (Educational Resources Information Center, 1966 through August, 1998) a bibliographic database sponsored by the United States Department of Education; (3) *PsycINFO* (1967 through August, 1998) which contains citations and summaries of journal articles, book chapters, books, and technical reports, as well as citations to dissertations, as well as international material selected from more

than 1,300 periodicals written in over 25 languages; (4) *SocioFile* (1974 through August, 1998) which contains abstracts of the world's literature in sociology and related disciplines including approximately 1,900 journals worldwide in all languages. In addition to the library search (described above) a web search was performed using the same keywords, through seven different search engines.[7] Although the most recent estimates place the number of distinctive "content areas" available on the world wide web at approximately 20 million (Lucht, 1998) this search similarly revealed zero hits.

The fruits of these searches were indeed meager. Probably the most relevant hit produced an article (outside the scope of the present study) that discussed politics in conducting cross-cultural training with evaluation treated as a separate issue. One explanation for the apparent absence of such discussions might be organizational avoidance of evaluation in general. In discussing the politics of information and analysis Pfeffer (1992) stated "Organizations are notorious for avoiding evaluation and avoiding looking backward." (p. 263) Yet politics have long been considered in the program evaluation literature. For example, in discussing political and economic rationality in reference to internal evaluation, Love (1991, p. 128-129) stated "An organization is a coalition of various stakeholders, each with their set values and intentions, that is held together through a political process."

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[7] The search utility called *MetaCrawler* (http://www.metacrawler.com/) simultaneously uses the individual search engines *AltaVista*© *Excite*© *Infoseek*© *Lycos*© *Thunderstone*© *Webcrawler*© *Yahoo!*©.

Chelimsky (1987) noted that any discussion of politics and program evaluation research can be informed by the original work of Weiss (1973) in which the role of evaluation in public policy decision making was considered. In asserting that "programs are political creatures" Weiss (1987, p. 48) clearly highlights this dimension of program evaluation. According to Weiss (1984) an obstacle to the use of evaluation is fragmentation of authority. Particularly in large organizations no one person or small group of people has the exclusive authority to make decisions: "Staff in many offices have to be consulted, outside constituencies have to be accommodated" (p. 173).

Focusing on the role of the evaluator in evaluation utilization, the so called "Weiss-Patton Debate" (Patton, 1988a, 1988b; Weiss, 1988a, 1988b) also relates to organizational constituency issues. Smith and Chircop (1989) analyzed this debate in terms of fundamental differences between decision-making communities: (Weiss) adversarial, disparate special interest communities characterized by weak managerial control and arational and/or political decision making concerned primarily with the ends of evaluation; versus (Patton) a more cooperative and unified community of shared values and common goals or agreed upon ends characterized by more direct managerial control and concerned primarily with gaining consensus on means toward these ends. The former argument limits utilization and the role of the evaluator to communicative action, while the later focuses on purposive-rational action related to technical competency. Since this exchange, Patton has acknowledged the political nature of evaluation. Discussing the power of evaluation as intrinsically political Patton (1997) asserts that the use of evaluation will occur in direct proportion to its power-enhancing capability to "reduce the uncertainty of action for specific stakeholders" (p. 348).

Stakeholder mapping (see originally, Bryson & Crosby, 1992, pp. 377-379; also cited in Patton, 1997) in which program stakeholders can be categorized using a matrix according to their initial inclination toward the program (support, opposition, or neutrality) and how much they have at stake in the evaluation's outcome (a high stake, a moderate stake, or little stake), is offered as a means to conceptualize stakeholder relations with respect to the program being evaluated. Patton also describes program administrators, funders, clients, program staff, and others as among potential members of an "evaluation task force" assembled specifically to identify such diverse perspectives. These members should represent "the various groups and constituencies that have an interest and stake in the evaluation findings and their use, including the interests of program participants" (p. 354). In discussing how evaluators choose among potential stakeholders, Mark and Shotland, (1985) identified two dimensions as important: perceived power and perceived legitimacy of the group. Power refers to the ability to influence policy decisions involving the program being evaluated (e.g., program funders are high in power). Legitimacy refers to the group's reasonable interests in one or more aspects of the program and its results (e.g., program participants or recipients of knowledge and skills). These ideas were incorporated in developing the predicted relationships among stakeholder groups in the research questions proposed. The conceptual framework developed to situate the study is presented next.

Conceptual Framework

The conceptual framework is illustrated in **Figure 1.** This reflects both the purpose of the study and its orientation within extant knowledge as reflected in the literature reviewed. In the organizational context, effectiveness is characterized as a

complex construct based on multiple-constituency perspectives. Multiple-constituency views of effectiveness recognize and accommodate the influence of power, particularly that of the internal coalition (Mintzberg, 1983) in terms of the systems of authority, ideology, expertise, and politics. This overarching reference frame provides context for three main conceptual elements involving training results and evaluation, as well as the role of training program stakeholders. Training results are defined by stakeholder perceptions of traditional (e.g., accounting-based, financial) and emergent (people and knowledge based) outcomes. Training evaluation involves stakeholder group perceptions of the purposes, processes, and consequences of evaluation. Purposes can be categorized as mostly formative (as for program improvement) versus mostly summative (as for program judgment). Evaluation processes include the collection, analysis, and presentation of data and information related to evaluation. Consequences focus mainly on evaluation utilization in terms of instrumental, conceptual, symbolic, and process uses. Stakeholder perceptions of training results are shown to potentially affect or influence perceptions of training evaluation. Stakeholder groups include training program *sponsors*, *participants* (trainees), and program *providers*. Sponsors and participants are the internal clients of training served by providers who develop, deploy, and maintain the program.

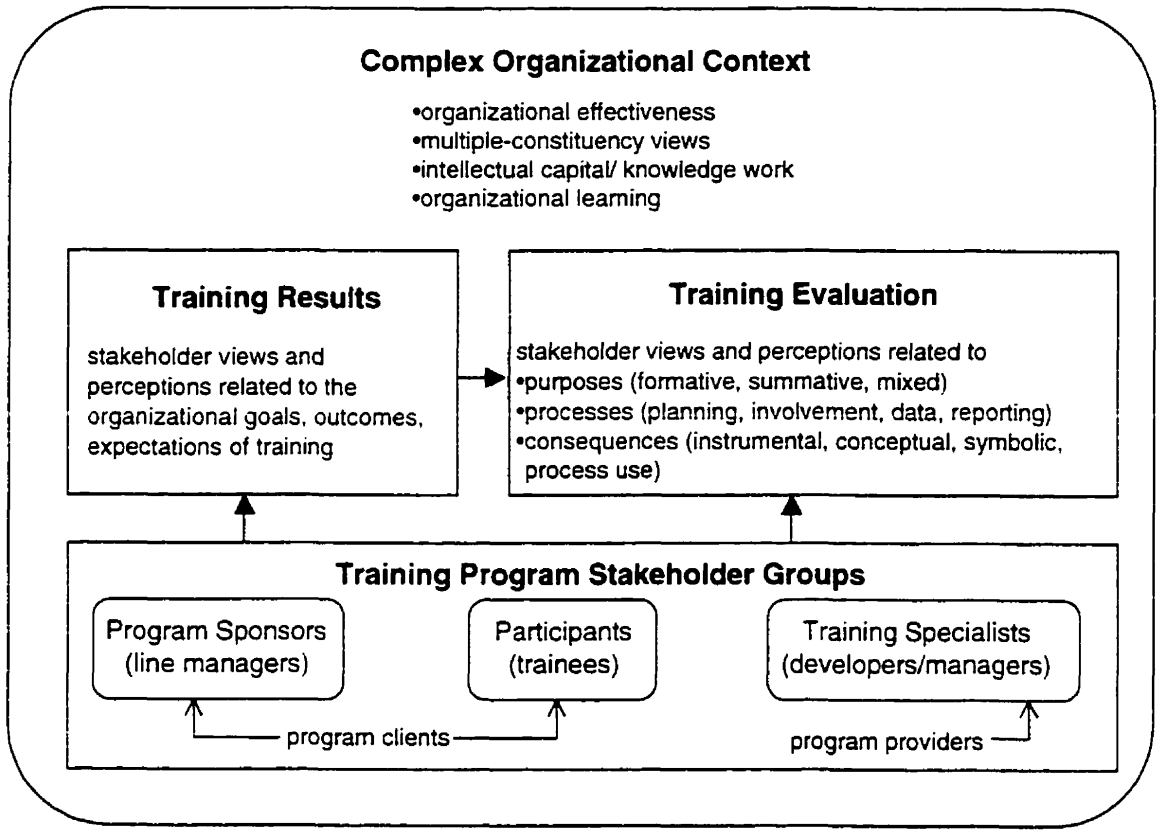

Figure 1. Conceptual framework.

Summary of Literature Reviewed

Current training evaluation theory and practice is limited by gaps related to untested assumptions involving undifferentiated stakeholder groups and traditional evaluation approaches. Failure to acknowledge perceptual variations among stakeholder groups has also severely restricted the application of organizational power theory in the domain of training program evaluation. The literature reviewed has sought to trace a common thread through several fabrics of knowledge not typically integrated—or even discussed in association with each other. The common thread involves stakeholder perceptions of training results and evaluation. The fabrics are organizational studies, training evaluation, and program evaluation.

The research questions (and predictions) of the current study target these gaps. Expressed another way, current training evaluation practice can be thought of as a simplistic picture on a transparency. Yet both training and evaluation occur within the organizational context. Knowledge from the other literature areas discussed thus represents additional such pictures of detail. When all of the transparencies are layered together, a more realistic overall image of training results and evaluation emerges. While the literature reviewed suggests that different stakeholder groups perceive varied images of organizational training results (e.g., in terms of the traditional and emergent indicators described), empirical evidence for this is rare. In particular, the extent and dimensions of variation among stakeholder groups relative to training results is not well understood. The first research question and set of predictions targets this gap. In relation to this, the professional training evaluation literature has fueled much practice from a relatively little

theory. This situation has been responsible for a methodological chasm between theory and practice. For while it is intuitively sensible to believe that the planned learning espoused by training professionals must have some positive organizational effects, these are extremely difficult to measure. Moreover, specifically in knowledge-based organizations of highly-skilled professionals who are constantly learning in many ways, such measurement attempts "open the door" to multiple-constituency, stakeholder-based, and ultimately political implications for training evaluation. Yet the relationship between stakeholder group views of training program evaluation and the results these groups perceive for training has not been investigated. The second research question and set of predictions address this. The methodological approach used in this study was chosen to address the research questions raised. An overview of methods used for the study is presented next.

Chapter 3

Methods and Case Organization

The overall study consists of an extensive single-case (organization) empirical study organized into three phases. This chapter provides a description of the methods employed. It includes a description of the purpose, sample, instruments, procedures, and analyses used in each study phase. A description of the case organization is also provided here. The three chapters following this one contain detailed discussions of the results obtained in each of the three study phases.

Complementary, mixed, methods were sequenced in these three interrelated phases as shown diagrammatically in **Figure 2**. The use and combination of quantitative and qualitative methods in research, evaluation, and employee training have been well described (Rutman, 1984; Schmitt & Klimoski, 1991; Sogunro, 1997). From a research perspective Greene, Caracelli, and Graham (1989) note that methodological complementarity uses qualitative and quantitative methods to measure overlapping but also different facets of a phenomenon to yield an enriched, elaborated understanding. Triangulation refers to the designed use of multiple methods with offsetting or counteracting biases in investigations of the same phenomenon in order to strengthen the validity of inquiry results through convergence.

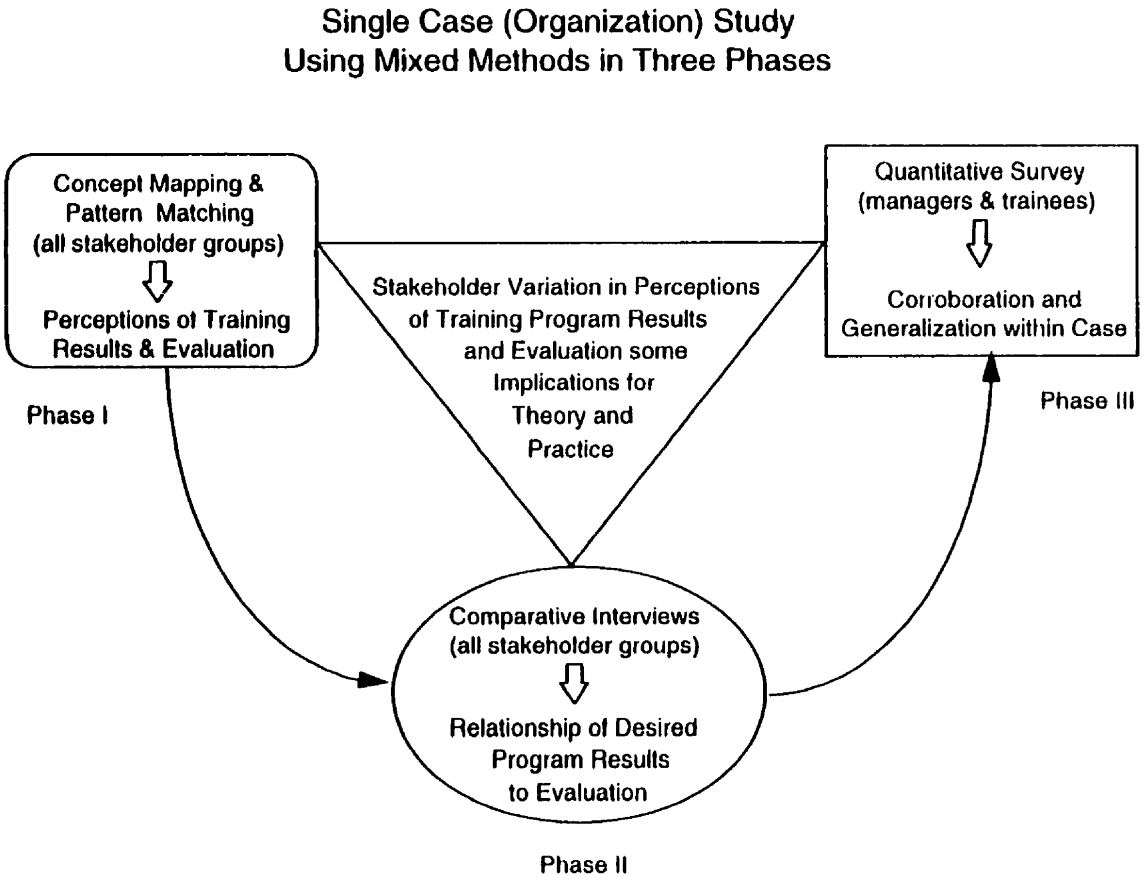

Figure 2. Methodological integration of three study phases.

The goal is enhancement, illustration, and clarification of results especially to increase the interpretability, meaningfulness, and validity.[8] This is achieved by both capitalizing on inherent method strengths and counteracting inherent biases in methods and other sources. In specific reference to the case study, Stake (1994) also noted that triangulation has been generally considered a process of using multiple perceptions to clarify meaning, verifying the repeatability of an observation or interpretation.

The phase 1 research employed concept mapping and pattern matching to identify individual stakeholder group perceptions of training results with reference to the first research question. The concept mapping process applied encompasses both qualitative and quantitative methods. These are described in more detail later. Pattern matching was further used to develop an empirical understanding of perceptual variation across stakeholder groups. This study phase also partially addressed the second research question in that all stakeholders also rated the relative importance of training results in terms of their importance for training program evaluation.

The phase 2 research addressed study question two directly. It was further used to both confirm phase 1 results and to further investigate perceptual variations among the stakeholder groups regarding the purposes, processes, and consequences of training program evaluation. This phase 2 approach consisted of a series of one-on-one, interviews involving members from each stakeholder group. All interviews were audio taped and transcribed for coding and analysis.

The phase 3 research further built on results from the previous two phases. This third and final study phase involved the use of a questionnaire deployed to the two large

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[8] Validity in the research process has been discussed at length by Brinberg and McGrath (1985).

stakeholder groups (management sponsors and training participants) within the case organization. The quantitative analyses of these data were used to further complement and generalize findings within the case organization in the context of the overall study. **Table 3** provides an overview of the methods, instruments, samples, procedures, and analyses used in the three research phases. Further details for each phase are provided below. Before considering these, however, the context for the study is described in terms of the case organization involved.

Study Context: Case Organization

The overall investigation is a single case study. A case study is both the process of learning about the case and the product of our learning. Case study is not a methodological choice, but a choice of object to be studied. Its central purpose is to optimize understanding of the case rather than generalize beyond (Stake, 1994; 1995).

The case organization is a division of a multinational network design and engineering company (based in Eastern Ontario, Canada). The main activities of the case organization involve the design and development of products for market in the telecommunications industry, specifically fiber-optic transmission and optical carrier (OC) network hardware and software. As shown in **Figure 3** the case organization (sometime referred to simply as "transmission") is situated as one of several divisions within the research and development (R&D) group of the company. The total population of the R&D group is approximately 13,000 employees. The company as a whole has a total global presence of approximately 75,000 employees operating in over 150 countries and territories worldwide.

Table 3. Overview and Summary of Study Phases

Phase	Purpose	Instruments	Sample	Procedures	Analysis
1	addresses research question 1 regarding stakeholder perceptions of training program results (concept maps); quantifies dimensions of perceptual divergence among groups regarding both training results and evaluation (pattern matches); partially addresses question 2	structured card sort; importance rating instructions and forms (see example in Appendix B) for concept mapping and pattern matching; preliminary concept maps and cluster lists for group interpretation	39 program stakeholders arranged in three groups: (13) program sponsors and line managers (13) training specialists and training managers (13) training participants	collect focus prompt statements; edit for redundancy, clarity, and conciseness; prepare mail-out packages (for individual sorting and rating); receive completed packages back; input sort and rate data into database; construct concept maps with respective stakeholder groups	multidimensional scaling, cluster analysis; consensus pattern matching across groups; compute pattern match correlations for group perceptions of training/ evaluation importance; compute bridging indices at item and cluster levels; use Concept System Software
2	clarify, interpret, and confirm the phase 1 results; address research question 2; explore extent to which views about evaluation depend on training program results perceived by group; inform phase 3 quantitative survey	concept maps of respective groups constructed in phase 1; semistructured interview guide document analysis	15 program stakeholders randomly selected from phase 1 sample and arranged in three groups: (5) program sponsors and line managers (5) training specialists and training managers (5) training participants related documents	randomly select from original stakeholder group sample; invite and arrange one-on-one interview session; semistructured comparative interviewing across groups; audio tape and transcribe all interviews	code development using procedures described by Miles & Huberman (1994), start code list; text analysis using NUD.IST software; construct conceptually clustered matrix displays to summarize results
3	further address research question 2; validate and extend knowledge created in phases I and II quantitatively using two large stakeholder groups	survey questionnaire	n=280 engineers and general line managers broken out as 220 engineering staff and 60 managers	mail-out survey package; letter of transmittal with follow up reminder by internal electronic mail	descriptive statistics; univariate and multivariate analyses; Cronbach's α; t-tests; MANOVA; Stepwise multiple regression

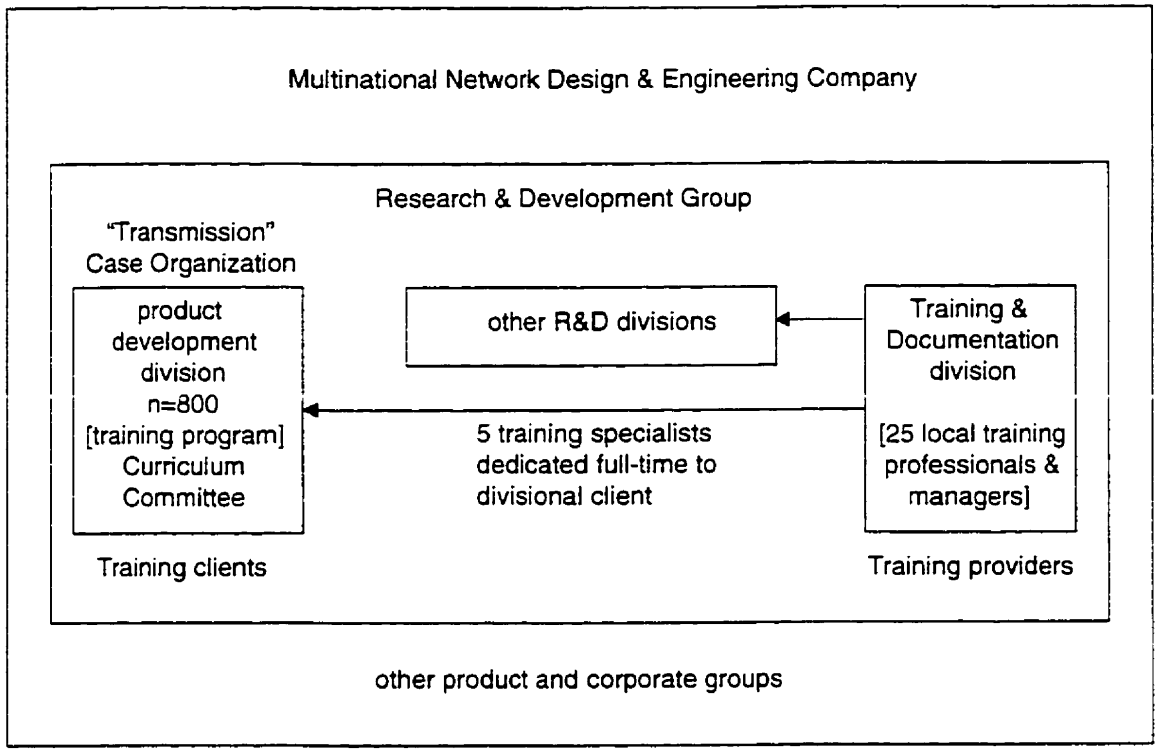

Figure 3. Situation of case organization within the company.

The case organization consists of approximately 800 local, full-time technical and managerial personnel. These employees are knowledge workers with professional occupational descriptions such as software and hardware designers, engineers, scientists, and other highly skilled managerial, administrative, and technical support staff. As a division of the R&D group within the company, a broad range of training, education, and development opportunities are available to the general staff from both internal and external sources.

The divisional training function has developed into a formalized and internally administered program funded annually through an operations budget. The annual funding level for training staff associated with the program ranged between $300,000 and $500,000 (US) during the period of the study.

The program itself is bounded within the case organization (see Figure 3). This program consists primarily of policies, procedures, products, and services in the areas of training needs assessment, design/development, instructional deployment, course-level evaluation, and administrative support. Specific instructional offerings include a broad range of interventions to support essential skills and competencies in the case organization. These are developed and deployed as instructor-led, self-paced, computer-based, video, and audio instruction. Many of these have been arranged and organized into "training tracks" in major job responsibility areas. During the period of the study there was no formal evaluation process in place for the training program as a whole. Course evaluation is carried out through informal reviews of individual end-of-course satisfaction surveys.

Annual program staff funding level decisions are generally made on an ad hoc basis by the chairman of the Transmission Curriculum Committee (TCC). This core committee of 12 individuals meets locally to review the status of the training program on a quarterly basis. The chairman acts in consultation with the five training professionals and six other managers from the case organization who also hold responsibilities as training program sponsors. These six line managers, who work closely with the training staff, specifically represent knowledge development areas pertaining to (1) hardware, (2) software, (3) verification, (4) administration, (5) management, and (6) operations training.

Program decision making is based primarily on input from TCC management representatives in the case organization, as well as consultation with training professionals from the training provider group. This is a much smaller group consisting

of training developers and training managers who also provide similar training services to other divisions within the R&D group (see Figure 3).

The data and information used for training program staff funding decisions generally involves quantitative measures associated with training participants (product developers) use of the program. This includes, for example, the number of training-days delivered, number of registrants, course wait-list numbers, trainee feedback and quality system audit data. More subjective influences include general impressions of the program sponsors regarding the popularity and effectiveness of the program. **Appendix A** contains a detailed description of the program policies and procedures.

Three distinct training stakeholder groups can be identified in connection with the program. These include program sponsors, training participants (trainees), and training developers. The population numbers of the three groups vary widely. Training participants comprise the largest relative population at approximately 700 individuals. Managers in the case organization (program sponsors) consists of approximately 100 individuals at all levels (managers, senior managers, directors, vice-presidents). Both the training participants and training program sponsors are situated within the case organization. The training group is situated in a division that is separate from the case organization. The training division houses 25 local training specialists and training managers, five of which are dedicated to the training program. This number includes the training professionals funded by and dedicated to the transmission training program. Over the period of the study this included one training manager and four full-time training specialists who report to this manager. Although this manager formally reports to a senior manager within the training division, he has a strong "dotted line"

commitment to the chairman of the TCC. It should be noted that the relationship between the training group and the case organization has been historically a good one. Within the culture of the larger R&D group, this relationship reflects the generally good working relationships, steady growth, and evolution within the R&D group as a whole. The organizational history and culture of the case organization is described next.

Organizational History and Culture

The company has a long and interesting history. This is also true of the R&D group in which the case organization is situated. While a discussion of the historical roots and evolution of the company and R&D group are well beyond the scope of this study, this section presents a brief overview and history of training, learning, and culture specifically within the case organization.

The SONET (synchronous optical networks) transmission case organization has its origins in the mid 1980s. It was originally established as specific division within the R&D organization to focus on the development of fiber optic transmission technology and product applications.[9] Both the larger R&D group and the transmission division (within R&D) were funded through a separate budget which historically averaged approximately 15% of the total annual company budget. Throughout the first half of the 1990s the total annual transmission (division) budget exceeded $100 million (US).

From its inception the culture of the division has largely mirrored that of the larger R&D organization. This was characterized by close, informal, working arrangements among knowledge workers—engineers and scientists as MSS or members

[9] Many additional sources describe the technology and application of fiber optic technology (see, e.g., Winch, 1998).

of the scientific staff. Beyond the formal professional and academic credentials (e.g., university engineering degrees, technical certificates, professional engineer certifications) brought or developed by employees, learning was generally accomplished mostly through informal mechanisms related to personal contacts in the job environment or self-initiated means (reading, membership in professional organizations, project research and involvement).

Since the decade of the 1970s when the R&D group was formally launched, training evolved steadily into a formalized function.[10] In the early 1990s (1992-93) the "transmission training program" (described) was formally established to specifically serve transmission employees. In addition to the general rise of training professionalism this move was also influenced by the growth in popularity of international quality standards such as the ISO standards (see literature review chapter).

Many of the constructs and processes described by Huber (1991) can be used to describe organizational learning in the case organization. For example, Huber described "congenital learning" as a combination of knowledge inherited at the conception of an organization and that acquired prior to its birth. The transmission group clearly inherited knowledge from the larger R&D group which also acquired such knowledge prior to the birth of the transmission division. Without going into undue detail, both the R&D group and the transmission division can be described as having engaged in other forms of organizational knowledge acquisition. These include "experiential" and "vicarious" learning. For example, a form of experiential learning described by Huber involves "experimental learning". This involves the use of (usually informal) organizational

experiments as learning mechanisms. According to Huber although the literature contains very few studies of experimentation by organizations:

> An exception to the general lack of empirical study of organizational experiments is the literature on program evaluation, where in effect a program is an experiment even though that is not its purpose. (p. 92)

Indeed, within the culture of the organization, the transmission training program itself fits this description well. This is so because it was the among the first of its kind to be formalized and funded as a distinctive training program within the larger R&D group. As suggested by Huber, while no sponsoring manager would justify such a program solely as an organizational experiment, most programs usually have an ostensibly rational purpose that is formally stated even though they also bear clear characteristics as organizational experiments. Huber's connection between such experiments and program evaluation is most appropriate in the present case.

Evidence of vicarious learning or the acquisition of organizational knowledge through second-hand experience also exists in the case organization. According to Huber the use of consultants, professional meetings, trade shows, publications, vendors and suppliers, and professional networks all represent means of acquiring corporate intelligence through vicarious learning. All of these means are clearly evident in the case organization. Beyond this, the nature of the industry itself is such that vicarious learning plays a key role in the evolution of its technologies and product capabilities.

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[10] This evolution roughly coincides with the pan-industrial rise of training professionalism (see, e.g., Pepitone, 1995).

In sum then, the case organization can be said to have strong learning culture rooted in that of the larger R&D group. This culture was characterized by more informal means and mechanisms of learning in its earlier years, and more formal (especially training-based) means of late. It is in this organizational culture and context that the present study was performed using methods organized into three research phases. These are described next.

Phase 1: Concept Mapping and Pattern Matching

The use and discussion of concept mapping in evaluation practice has been steadily growing over the past 15 years (Rizzo-Michelin, 1998). Although several approaches to concept mapping have been developed, the approach detailed by Trochim (1989a, 1989b; 1993) was selected for use in the present organizational case study based of its well-documented use in evaluation and program planning (Cousins & MacDonald, in press 1998; Knox, 1995), training design and evaluation (Moad, 1995) and its suitability for comparing among groups using pattern matching techniques.

The concept mapping process selected is often summarized sequentially in terms six-steps. These involve (1) *preparation*, in which the focus for the concept mapping project is operationalized, participants determined, and schedule developed; (2) *brainstorming* relative to a focus statement; (3) *structuring*, in which participants individually sort and rate the statements generated during brainstorming; (4) *map computation*, in which the software calculates point and cluster maps; (5) *group interpretation*, of the default map computed, and (6) *utilization* of the results for research or problem solving. The following sections describe the implementation of this process in the context of the study undertaken.

Purpose

This research phase addressed the first research question concerning stakeholder group perceptions of training results in the organization. Concept mapping was used to identify stakeholder perceptions of training results using input from three stakeholder groups. Pattern matching was used to compare and quantify both variations among the stakeholder groups in terms of their perceived importance of training results in the organization and their perceived importance of these same training results in terms of evaluation. This latter comparison (importance of training result in the organization versus its importance in terms of evaluation) also provided overlapping data useful to address the second research question. This is discussed further in Chapter 4.

Sample

The sample consisted of a total of 39 program stakeholders arranged into three equal groups of 13. The typically recommended project sample size for concept mapping is 15 (Trochim, 1993). In an analysis of 38 concept mapping studies, Trochim (1993) found the mean number of participants (statement raters and sorters) to be between 13 and 14. A total of 20 training providers (developers and managers) were randomly selected and invited to participate from the local training division. Of these 13 agreed to participate throughout the duration of the study. Similarly, 13 (of 20 randomly selected and invited) training program sponsors (managers in the case organization) also agreed to participate. A total of 30 training participants (engineers and designers) were randomly selected and invited to participate. Of these, 13 agreed to participate fully through the duration of the study. Because random selection was used, the 13 respondents in each group were deemed to be demographically representative of their

respective groups and there was no evidence or reason to believe these respondents differed substantially from non-respondents in any significant way.

Instruments and Procedures

The preliminary concept mapping activity required each member of each group to generate statements in response to a "focus instruction" regarding training results. Preliminary statement generation was done individually by each stakeholder group by brainstorming. The participant/trainee and training provider groups were involved in live brainstorming sessions facilitated by the researcher, while the program sponsors generated brainstorm statements in writing. These were submitted to the researcher by E-mail or by internal memo.

The preliminary concept mapping "focus statement" was a concise instruction directed to the group: *Generate statements (short phrases or sentences) that describe specific training program results that would contribute to the success of [the organization] over the next 12 to 24 months.* The "focus prompt" is used by respondents as a check while generating statements to stay on task. For the focus statement (shown above) each brainstormed statement should make sense when preceded by the following focus prompt: *One specific training program result that would contribute to the success of [the organization] over the next 12 to 24 months is... .*

A total of 219 raw response statements (77 participant/trainee; 70 training provider; 72 program sponsor) was stored in a database file for editing by the researcher. This editing process involved the combination or removal of obvious redundancies, clarification of terminology (acronyms, abbreviations, etc.), as well as checks for spelling and grammar. A final set of 100 statements was derived for the subsequent concept

mapping tasks. The proportionality of the original set of raw statements was preserved so that approximately one-third of the 100 statements came from each of the three groups (as in the raw set). The final list of statements was then presented to each individual (who participated in brainstorming) for sorting and importance rating.

Internal mail was used to distribute a package to each concept mapping participant to individually sort and rate the set of 100 statements produced. The sorting and rating activity involved sorting cards containing each statement into conceptually similar piles (Concept Systems, Inc., 1996b). Once the sorting task was complete each statement was rated for its relative importance in terms of both an organizational training result and as a training evaluation criterion. This was done by providing two separate rating forms and requesting respondents to rate the relative importance of each statement (1) as a training program result on the first form, and (2) as a training program evaluation criterion on the second form. The following scale was used for both ratings: 1=Relatively Unimportant; 2=Somewhat Important; 3=Moderately Important; 4=Very Important; 5=Extremely Important. The precise instructions as well as the statement importance rating and ethics[11] forms appear in **Appendix B**. After all participants had completed and returned their sorting and rating packages, three separate interpretation sessions were scheduled (one session per group). These interpretation sessions are part of the concept mapping process. They are discussed in more detail next.

[11] Ethical approval was granted by the University for the study in the three phases described. This approval is reflected in the *Certificate of Ethical Approval* signed by the ethics committee chair on April 18, 1997.

Analysis

This section describes concept mapping and its associated analytical procedures related to pattern matching and bridging calculations. All data were analyzed as a single project using the Concept System version 1.71 (Concept Systems, Inc., 1996a). Both the main statistical procedures (multidimensional scaling and cluster analysis) and the application of such specifically in concept mapping have been well-described (Anderberg, 1973; Davison, 1983; Everitt, 1980; Kruskal,& Wish, 1979; Trochim, 1989a, b; 1993). Rather than reiterate these details here, the following discussion is concerned with implementing the Concept System in the context of the study and providing an overview of relevant calculations related to pattern matching and bridging calculations.

A reference code was developed for each project participant to preserve confidentiality and improve convenience for analysis. The completed sorting data as well as the importance rating data from both importance rating forms was captured in a single project database for analysis. In this way individual maps could be generated for each stakeholder group and pattern matches could be performed both within (intra-group) and between (intergroup) groups. Also, because every participant supplied pile labels to each individual sort pile, it was possible to extract concept map cluster names (based on the top ten best pile labels calculated by cluster centroid proximity). These were used as a starting point for live map interpretation by each of the stakeholder groups.

Three separate concept map interpretation sessions were held to allow each stakeholder group to discuss, interpret, and agree on the final content of their group's respective map. A default six cluster map solution was used as the starting point for each interpretation session. The results of these interpretation sessions produced the final

concept maps (discussed as results in the next chapter). These maps also formed the basis for subsequent pattern matching analysis. The analysis process associated with pattern matching is described next.

Pattern Matching Analysis

In addition to three group-level concept maps, the main analysis of this phase involved pattern matching across stakeholder groups. Pattern matching is a general method that can use concept mapping information in various ways (see, e.g., Caracelli, 1989; Davis, 1989; Marquart, 1989; Trochim, 1985). The Concept System software does pattern matching at the map cluster level. Pattern matching allows for the combination of any two measures aggregated at the cluster level to see to what degree the measures match or whether they disconnect. By examining such combinations of measures, similarities and differences between stakeholder groups can be identified. According to Trochim (1989c; 1990) pattern matching is extremely powerful in its implications, particularly as a measure of divergence across groups. Pattern matching always involves two patterns. The patterns are based on measurements taken at the statement level. Almost any kind of measure can be used, depending on the purpose. For the present study, this involved exploration of relationships in stakeholder perceptions of the importance of training results in the organization and the importance of these same results in terms of evaluation.

A pattern match itself consists of two elements. First, there is the visual picture of the match. Second, every pattern match has a correlation coefficient associated with it. The visual picture of the match is shown through a ladder graph which is essentially two vertical scales (one for each measure) joined by horizontal lines for each cluster, showing

comparative performance on the two measures. If the match is a perfect one, the lines are all horizontal and the resulting graph resembles a ladder of sorts. Ladder graphs are especially useful for quickly spotting disconnects (as negative correlation coefficients) between two measures.

Three variations of pattern matching have been defined to include *outcome*, *consistency*, and *consensus* type pattern matches (Trochim, 1990, 1996). Of these, only consensus pattern matching was used (and will be discussed) in connection with the current study. In a consensus pattern match the theoretical ratings of one group are compared with those of another group as a gauge of agreement or consensus between the measures being compared visually and quantitatively using correlation values. The correlation coefficient associated with each match describes the strength of the relationship or match between the two variables. The correlation ranges between -1 and +1. Values near 0 indicate the absence of a match; values close to either pole indicate stronger matches. Negative values imply an inverse relationship (when one measure is high, the other is low and vice versa). Positive values imply a synchronic relationship (high with high and low with low). Together, the ladder graph and correlation describe the relationship between the patterns of the two measures (Concept Systems, 1996a).

Because pattern matches are done comparing two groups at a time, the comparison of three groups among each other would require three main comparisons. Thus program sponsor perceptions were compared separately and respectively with those of program providers and participants. Similarly program provider perceptions were compared with those of training participants. Such pattern matching combinations

resulted in a series of correlation coefficients and graphical ladder diagram comparisons which are discussed as results in Chapter 4.

The two importance scales described allowed all participants to rate each statement twice. A total of 21 pattern matches were made to compare both within (intra) and between (inter) group perceptions of training program results and training program evaluation. Intra-group pattern matches consisted of comparisons of general to training program evaluation (TPE) importance. This resulted in three pattern matches, one per stakeholder group. There were also18 intergroup pattern matches. These consisted respectively of six pattern matches (three groups x two matches per group) each for general to general importance, general to TPE importance, and TPE to TPE importance. The results of these analyses are described in the following chapter. The calculation of the bridging index is considered next.

Bridging Analysis

A bridging value is computed for each statement and cluster as part of the concept mapping analysis after the concept map is computed. As an index a bridging value always ranges from 0 to 1. The usefulness of the bridging value is that it indicates whether a statement was sorted with others that are close to it on the map or whether it was sorted with items that are farther away on the map. This index helps in the interpretation of what content is associated with specific areas of the map. For example, statements with lower bridging values are better indicators of the meaning of the part of the map they are located in than statements with higher bridging values.

Bridging can also be computed at the cluster level by taking the average of statement bridging indices in the cluster. Clusters with higher bridging values are more

likely to "bridge" between other clusters on the map. Clusters with low bridging values are usually more cohesive, easier to interpret, and reflect the content well in that part of the map. Bridging results for the concept maps produced are further discussed in Chapter 4. The interview methods associated with the phase 2 research are described next.

Phase 2: Interviews

In addition to the pattern matches performed in phase 1, interviewing provided the principle means for data collection and analysis for the phase 2 research. Beyond its use across a wide range of fields and disciplines in the social sciences, this method also has an emerging history of application specifically for training and group learning related research in technology-based organizations (see, for example, Brown & Duguid, 1991; Sacks, 1994; Shayo & Olfman, 1993).

Purpose

The main purpose of phase 2 was to address the second research question by further exploring differences in perceptions about training results and the extent to which views about training program evaluation depend on such perceptions. To this end phase 2 also served to clarify, interpret, and extend the findings from phase 1. This was done by obtaining data on individual views about the concept map produced by their stakeholder group (individual validation of group results) and then discussing the purposes, processes, and consequences of training evaluation.

Sample and Procedure

Eight participants from each stakeholder group from study phase 1 were randomly selected and invited to participate in phase 2. Five individuals from each of the three

stakeholder groups agreed to be interviewed. Individual, private interview sessions were scheduled with each member of the three stakeholder groups. Before each interview, permission was specifically requested and obtained to audio tape record the session. Realizing that times probably would range and vary (depending on the length, depth, and complexity of any given respondent's reply), each interview was scheduled for 1 hour in duration.

All interviews were conducted on the premises of the case organization by the researcher. His affiliation with the case organization is viewed as a methodological asset based on a shared organizational and program experience with the respondents. According to Holstein and Gubrium (1995, p. 46), such prior experience "...provides direction and precedent, connecting the researcher's interest to the respondent's experience, bridging the concrete and abstract." This promotes useful common awareness that can be referenced as a way of linking the respondent's experiential location to the researcher's more conceptual issues and questions.

Instrument

In view of the second research question, a semistructured interview guide was developed to facilitate the semistructured interviews. According to Borg and Gall (1989) the semistructured interview has the advantage of being reasonably objective while still permitting a thorough understanding of the respondent's opinions and reasoning behind them. The following section presents a more detailed description of the interview guide.

Interview Guide

A semistructured, interview guide was developed and used for the one-on-one interviews. Pilot testing of the instrument was done with two individuals from each of the three stakeholder groups who did not participate in the study proper. The pilot testing process involved use of the instrument in mock interview sessions that were combined with participant debriefing about quality and clarity of the interview questions. Notes were taken, reviewed, and used to improve the phrasing and content of the semistructured guide. The instrument was refined and updated based on the pilot tests performed.

The final interview guide was organized into three main parts. Part 1 sought to corroborate each individual's views about organizational training results with those of their respective stakeholder group. This was accomplished by showing each respondent their group's concept map (generated in phase 1). This map depicted a stakeholder group-level view of organizational training results. In addition to seeking details related to further interpretation, respondents were prompted to describe how well the map represented their own personal views about training results. Part 2 of the guide sought views and ideas about training program evaluation by inviting respondents to discuss their views of the purposes, processes, and consequences of evaluation. Part 3 of the instrument was included to further explore explicit perceptual differences among the groups by inquiring about any specific differences perceived. The interview guide is contained in **Appendix C**.

Analysis

All interviews were audio taped and transcribed verbatim to enhance descriptive validity as discussed by Maxwell (1996). To enhance audio quality for accurate

transcription special care was taken to use high-quality recording equipment. The major components of this included a good quality multi-channel recording unit with variable tape speed control using two separate microphones with complimentary audio response characteristics.[12] For redundancy (in case one channel or microphone failed during an interview) each microphone was arranged to feed a separate audio channel. This equipment performed very well to produce a set of ten, 90-minute cassette tapes containing the interview data which was transcribed to text.

These data were analyzed following Miles and Huberman (1994) who favor deriving a start list of codes from the conceptual framework and research questions guiding the study prior to fieldwork. A list of "start codes" was developed corresponding to the research questions within the conceptual framework. The coding list underwent several revisions both prior to and during fieldwork. After preliminary analysis several "add on" and "pattern" codes were further developed. In addition to constructing themes from the data (Rubin & Rubin, 1995), pattern coding was used to develop tentative explanations and relationships among coding categories and emerging constructs. Pattern codes pull together a lot of material into more meaningful and parsimonious units of analysis as a sort of meta-code. **Appendix D** contains an explanation of the codes developed.

QSR NUD-IST (4.0) software was used to facilitate phase 2 data analyses. This application was chosen because it greatly expedites the data storage and retrieval process (see, Richards & Richards, 1994).

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[12] The recorder used was a *Fostex*, X-15 Multitracker. The two microphones were *Calrad* super-cardioid, electret shotgun, and *Realistic* PZM, surface contact piezoelectric units.

Appendix E shows an example of a NUD-IST index tree and command file developed for the analysis. Several data displays were constructed to summarize analysis and coding results particularly in reference to the research questions. These displays, respectively depicting stakeholder perceptions of training program results and stakeholder perceptions of program evaluation, are presented and discussed as interview results in Chapter 5.

Phase 3: Survey

Purpose

The purpose of the survey was to corroborate results across phases and specifically to further address research question two by focusing on the relationship between stakeholder views about training program evaluation and the training results using the two large stakeholder groups. Quantitative methods were viewed as particularly useful to further explore differences among the manager and non-manager stakeholder groups as the two relatively large stakeholder populations in the case organization. Recognizing that the results of the overall study remain a single case, and therefore cannot be generalized beyond the case organization, phase 3 sought to complement and generalize (within the case organization) results obtained in the previous two phases.

Sample

As mentioned, during the period of the study the training participant population consisted of approximately 700 engineers, designers, and technicians, while the line management population consisted of approximately 100 managers in the case

organization. Based on researcher experience with the organization it was known that managers generally respond to surveys at a proportional rate of three to one relative to engineering staff, an appropriate proportional sample was prepared using simple random sampling principles (see, e.g., Miller, 1994). Also, because training is equally available to all members of all organizational subdivisions, sampling stratification was considered but deemed unnecessary. From the organizational population a list of names (each accompanied by departmental and job classification information to distinguish managers from non-managers) was randomly selected using the most current internal employment record information available from the company's human resources group.

Implementation and Response

Several authors have emphasized the importance of achieving sufficient response rates in surveys. For example, Fink (1995a) discussed the problems associated with non-response at both the survey and item level. Furthermore, Bourque and Fielder (1995) emphasized the importance of the many details of survey preparation and administration. They discussed many of these in terms of obtaining a valid and reliable sample in connection with achieving a sufficient response rate. This was a particular concern for the present research because the population sampled is very routinely polled and surveyed using all varieties of techniques (mail, phone, E-mail, web, even live solicitation). Hence, extreme care and effort was taken to maximize the response rate of this survey. This included careful considerations of details such as questionnaire objectives; general length and format; item wording, length, and format; use of clear and sufficient instructions and contact information; pilot testing; cover letter; and follow-up reminders.

A total of 415 surveys were mailed via interoffice mail to randomly selected individuals from the case organization population sampling frame consisting of 610 names. The list of individuals for the sample was obtained from the host organizations human resources database and was sorted to show the names of regular, full-time employees with job band classifications five through ten (inclusive). It included a total of 458 non-managers (bands 5 and 6) and 152 managers (bands 7 through 10). This population of knowledge workers consists mostly of telecommunications engineers, programmers, designers, as well as project and line managers. Because 15 individuals from the original list were later determined to be invalid because they had left the division (or company), or were otherwise unavailable to participate (for example due to vacation or leave of absence) a final total of 400 surveys were sent to individuals including 100 managers and 300 non-managers.

An achieved sample of 280 (70% response rate) was obtained consisting of 60 managers and 220 non-managers. This represents a proportion of 21% managers and 79% non-managers who responded to the survey. Careful random sampling is credited for attaining an achieved sample with demographic proportions closely comparable to their respective (total) population proportions. For example, the sampling frame included 25% managers and 75% non-managers as determined by job band.

As shown in **Appendix F** survey response was also broken down by the experience level (time in company), product development responsibility, and job category of the respondents. Nearly half (47%) of all respondents indicated 1 to 5 years of experience in the company followed by 20% who indicated 10 to 20 years experience. Proportionally smaller percentages of respondents indicated 5 to 10 years (14%), less

than 1 year (14%), or over 20 years (5%) of experience respectively. Approximately 44% of all respondents indicated a primary affiliation with the OC-192 development group. Another 18% identified an affiliation with the OC-48 group while OC-12 was identified by 14% and OC-3 by 13% of respondents. The category "other" product group was indicated by 11% of respondents who wrote in affiliation such as TNUI (transport node user interface), or various combinations of the OC development groups among others. Nearly 90% of respondents indicated job functions of either software (60%) or hardware (29%) as their primary job function. Verification was indicated by 2% and captive office by 1% of respondents. The "other" job category was selected by 8% of respondents and included write-in functions such as "project management", "design field support", "customer support", "characterization", "program office", and "design advisor". All product groups were represented well by both managers and non-managers. For example, manager response by product group ranged from 15% (OC-12) to 40% (other). The "other" category included write-in job-roles such as "project manager" that correspond to specialized managerial roles.

Instrument

A four page questionnaire survey booklet was developed in view of research question two and the results obtained in the prior two phases. The final conceptual cluster titles from phase 1 were used as a starting point to identify six initial question categories for part 1 of the survey regarding perceptions of training results beneficial to the organization. These cluster titles reflected several common themes, such as customer and employee satisfaction, perceived by both line managers (training sponsors) and non-

managers (trainees). They were used to derive six distinctive categories for survey part 1 scale variable construction as discussed in Chapter 6.

The average importance ratings assigned by each of the two groups to the phase 1 statements was further used to identify training results within each of the six areas included in survey part 1. To do this a simple differential was calculated by arithmetically subtracting the average trainee ratings from the average sponsor ratings for each of the 100 statements. These calculations (performed using a common spreadsheet software application) resulted in a column of 100 difference scores (deltas) each corresponding to a phase 1 statement. A descending bubble sort was performed on this column of differences to identify rating dissimilarities between the groups.[13] As simple differences, these delta values were both positive and negative. A large positive value indicated a statement that was rated (on average) higher by the sponsor group relative to the trainees. A large negative value indicated the opposite relationship (a difference at or close to zero indicated minimal difference). For example, for statement #23 (support key performance plan of organization) the sponsor average importance rating (as a training result) was 4.08 (very important). The average importance for this same statement as assigned by trainees was 2.77 (somewhat to moderately important). The difference between these two averages was 1.31 indicating that sponsors generally rated the statement higher in average importance relative to trainees. A similar calculation for statement #8 (training is integrated with university-industry interaction programs) yields a difference of -0.93 indicating that trainees generally considered the statement (training result) more important relative to sponsors. In providing an indication of statements rated

differently by managers and non-managers, this process provided some objective guidance to formulate and balance the representation of the 20 items finally developed for part 1 of the survey. A minimum of three items per scale variable were planned. As discussed in Chapter 6, five of these variables contained three items while the sixth variable (on employee satisfaction) contained five items.

The phase 2 interview guide and results were also employed to formulate the items contained in part 2 of the survey. This survey section focused on respondent perceptions related specifically to training evaluation. The first three items were concerned with respondent perceptions related to the purpose of training evaluation. Items 4 through 8 focused on stakeholder involvement. Items 9 through 13 sought to capture respondent views about the type of data required for training evaluation. Items 14 through 17 were concerned with views related to evaluation reporting audiences. The last nine items (18 through 26) were focused on the consequences of training program evaluation especially in terms of conceptual, instrumental, and symbolic uses. Similar to the three sections of the semistructured interview guide developed for phase 2, the 26 items comprising survey part 2 sought to capture data related to stakeholder view of the purposes, processes, and consequences of training evaluation.

At the request of the management group that approved deployment of the survey ten items (part 3) were also included to measure respondent general satisfaction with the existing training program. This purpose was mentioned in the cover letter that accompanied the survey.

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[13] Although the spreadsheet used to produce the calculations is not provided in the thesis, the data in Appendix H can be used to calculate these delta values.

While the part 3 data was not used for the analyses reported in Chapter 6 the pooled analysis of these ten items was made available to respondents as promised in the cover letter. Because by far most respondents who completed parts 1 and 2 of the survey also completed part 3, and because part 3 was physically located on the last page of the survey form (just before the demographic section at the end) there was little concern (and no evidence) that the ten part 3 questions affected responses of the first two sections.

Technically and from an analytical perspective, the development and analysis plan of this instrument was also informed by prior survey research related to evaluation practice. Referencing Cousins, Donohue, and Bloom, (1996) the scale variables were constructed as linear combinations of Likert type item sets using the research questions and conceptual framework. As described below in the analysis section, relationships among variables were examined using bivariate and multivariate procedures. Intercorrelation matrices using Pearson correlation were examined for variable set patterns. Stepwise multiple regression was used to account for variation in criterion variables and to assess the relative uniqueness and magnitude of contributions by predictors. Repeated measures multivariate analysis of variance (MANOVA) was used to test for differences between groups.

The questionnaire was developed following general techniques of good survey design (see, e.g., Bourque & Fielder, 1995; Fink, 1995 a,b,c,d; Mangione, 1995; Miller, 1994; Rodeghier, 1996; Rosenberg, 1968). Realizing that the survey instrument was being developed primarily in relation to the research project as a new instrument and, therefore, does not enjoy long history to compare certain aspects of reliability and validity, these areas were, nevertheless, considered. For example, the instrument's

stability (test-retest reliability) and alternate-form reliability are obviously not known due to its single form and instance of administration. The homogeneity of items and scale variables was possible to assess using Cronbach's alpha. This is discussed further in Chapter 6.

The content, face, criterion, and construct validity of the survey were also considered, but again the initial administration of the instrument limits extensive conclusiveness here. As noted the content for the survey was derived from the conceptual framework with reference to the literature review performed. Care was taken to ensure a high quality and highly readable form to enhance face validity. Due to the research nature of the instrument, criterion validity (predictive and concurrent) could not be conclusively established. According to Fink (1995a) construct validity (convergent and discriminant) is established experimentally to demonstrate that a survey distinguishes between people who do and do not have certain characteristics. This can be accomplished in at least two different ways both of which rely upon existing (valid) instruments for comparison or well-developed theory. Again, due to the dearth of material available in either of these categories specifically related to the research undertaken here, conclusive claims about the construct validity of the instrument cannot be made. Rather, the research project as a whole might be viewed as a precursory contribution to efforts aimed at developing future versions of the instrument.

Pilot testing of the instrument was performed by mailing the form to a total of six members of the target population who agreed to complete it and provide feedback for improvement. These individuals did not participate in the survey proper. Comments from these individuals were used to ensure the appropriate level of language and usage of

terms understandable to the target population. Face validity was also examined by discussing the overall look, readability, time and ease of completion.

The survey form included two primary data collection sections with a total of 46 items related to respondent perceptions of general training results (part 1 containing 20 items) and training program evaluation (part 2 containing 26 items). A five-point, balanced, attitudinal scale was used for all items (strongly disagree to strongly agree). As mentioned the third section was included only to collect participant satisfaction data relative to the current training program. Because they are outside the scope of the present study, the results of these ten survey questions are not presented or discussed in connection with the present study. Similarly, as taken from the fourth and final survey section, only the demographic data about respondent job classification (i.e., manager or non-manager) were used in the current study.

To maximize the accuracy of data entry, the final instrument was produced as a scanable form using the software application called *Teleform* (version 5.4). This software produces survey forms from which data can be scanned directly into a number of database formats (e.g., SPSS) using a fax machine or flatbed scanner.

Implementation and Deployment

The survey deployed was both random and anonymous. To encourage participation and ameliorate the overall response rate, prenotification of all potential respondents was accomplished using standard postcards distributed through interoffice mail 1 week before the survey was mailed. Similar postcards were also sent as reminders 2 weeks after the survey package was mailed.

The survey package contained three items including (1) a cover letter, (2) the questionnaire form, and (3) a self-addressed interoffice mail envelope. A recommended return period of 1 week was suggested in the cover letter. To accommodate travel and vacations, a total period of 4 weeks was allowed for responses. The cover letter accompanying the survey was drafted by the principle researcher and co-signed on his behalf by the vice president responsible for training in the organization. The vice president's signature was used because (unlike that of the researcher) his name was well known among the potential respondents within the case organization. Such cover letter name familiarity has been shown to be beneficial in boosting survey response rates (Bourque & Fielder, 1995). The cover letter and complete survey form are shown in **Appendix G**.

Analysis

The research questions specified and the format of the data were the primary criteria used to select the general analytical procedures described below. All statistical analyses were performed using *SPSS for Windows* (8.0.0) software. Survey data were scanned into SPSS for analysis. In addition to item-level descriptive statistics such as number of respondents, item mean, and standard deviations, several other procedures commonly used for survey response analysis were also used.

Using the research framework and results from the prior phases, individual survey items were grouped together conceptually to calculate a reduced set of scale variables as linear combinations of item rating averages. Scale variables corresponding to training program outcomes, evaluation processes and consequences were computed and tested for reliability using Cronbach's Alpha as a coefficient of internal consistency. Cronbach's

Coefficient Alpha (α) is a general form of the Kuder-Richardson (K-R) 20 formula used to estimate the internal consistency of items when they are not scored dichotomously (Borg & Gall, 1989).

Program participant (non-management trainees) and management stakeholder groups were compared using univariate and multivariate testing procedures such as independent t-tests and MANOVA procedures. These procedures allowed for the comparison of stakeholder group scores on scale variables and multiple item sets considered to be dependent variables. Further analyses were also used to examine relationships between perceived training results and views of training evaluation. These included stepwise multiple regression analyses using the scale variables as criterion and predictor measures.

Factor analysis was also used to explore other patterns in the data. Several other relationships among variables were examined using a variety of bivariate and multivariate procedures. These included the construction of intercorrelation matrices using Pearson correlation coefficients to examine patterns among variable sets, as well as stepwise multiple regression to account for variation in the criterion (dependent) variables and to assess the relative uniqueness and magnitude of contributions by predictors. Between groups MANOVA was used to test for differences between manager and non-manager stakeholder groups.

Additionally, because a substantial volume of written comments from both managers and non-managers were also obtained, all written comments were coded and analyzed using QSR NUD-IST (4.0) software. As discussed later, the coding and indexing structure for this analysis was derived from the research questions and

conceptual framework based on written comments from each respective section of the questionnaire. The results of these analyses are provided and discussed in Chapter 6.

Chapter 4

Phase 1: Concept Mapping and Pattern Matching Results

As detailed in the previous chapter, the purpose of phase 1 was to address the first research question regarding stakeholder perceptions of training results. Training results as conceptualized by each stakeholder group are represented in three corresponding concept maps. Each map represents all 100 statements within the cluster groupings defined and labeled by each group. These concept maps are presented and discussed in sequence. In addition to generating the statements to describe training results, all members of each group also rated the relative importance of each result in terms of its general (organizational), and training program evaluation (TPE) importance. Importance rating along these dimensions allowed for pattern matching analyses to be performed both within and among the groups. The results of these analyses are presented and discussed in a separate section. The average ratings for both general and TPE importance are shown in the table contained in **Appendix H**.

Individual statement bridging values ranged from 0.00 to 0.93, however, most cluster bridging averages were 0.5 or less. The bridging average for each of the respective concept maps was .38 (training providers), .50 (training sponsors), and .51 (trainees). As discussed in Chapter 3, this indicates that training providers tended to sort statements slightly more consistently as a group relative to the other two stakeholder groups. Although a detailed discussion of the calculation and implications of bridging are beyond the scope of this study, the statement and cluster level bridging values for all stakeholder maps is provided in **Appendix I**. Stress values ranged from .2474 to .3045 for the maps and these are also shown in this appendix.

Providers

Each of the three groups began their concept map interpretation session using a default number of six conceptual clusters. The training provider group conceptualized the results of training as an essential product or service for internal clients. Compared to the other two groups, providers interpreted the fewest and conceptually broadest concept map clusters. The training provider concept map is shown in **Figure 4**.

The training provider group defined five conceptual clusters. In order of average general importance these are (1) benefits resulting from training (M=3.72), (2) customer value (M=3.71), (3) effective training program attributes (M=3.38), (4) employee satisfaction (M=3.34), and (5) skills and knowledge (M=3.29). These results emphasize the benefits and necessity of training in terms of achieving the goals of the client organization, particularly in traditional terms of productivity and efficiency. Recognizing that all statements describe "specific training program results that would contribute to the success of [the organization]" it is notable that the training provider group specifically labeled clusters as "benefits resulting from training" and "effective training program attributes" on their map. Among the individual statements ranked highest in average importance by this group were (#3) support customer's strategic and operational objectives (M=4.85), (#73) makes new people productive as quickly as possible (M=4.38), (#36) better support of strategic direction of organization (M=4.31), and (#11) training program objectives obtained directly from organizational business objectives (M=4.08). In contrast eight of the ten statements ranked lowest by this group were related specifically to employees as opposed to sponsoring management.

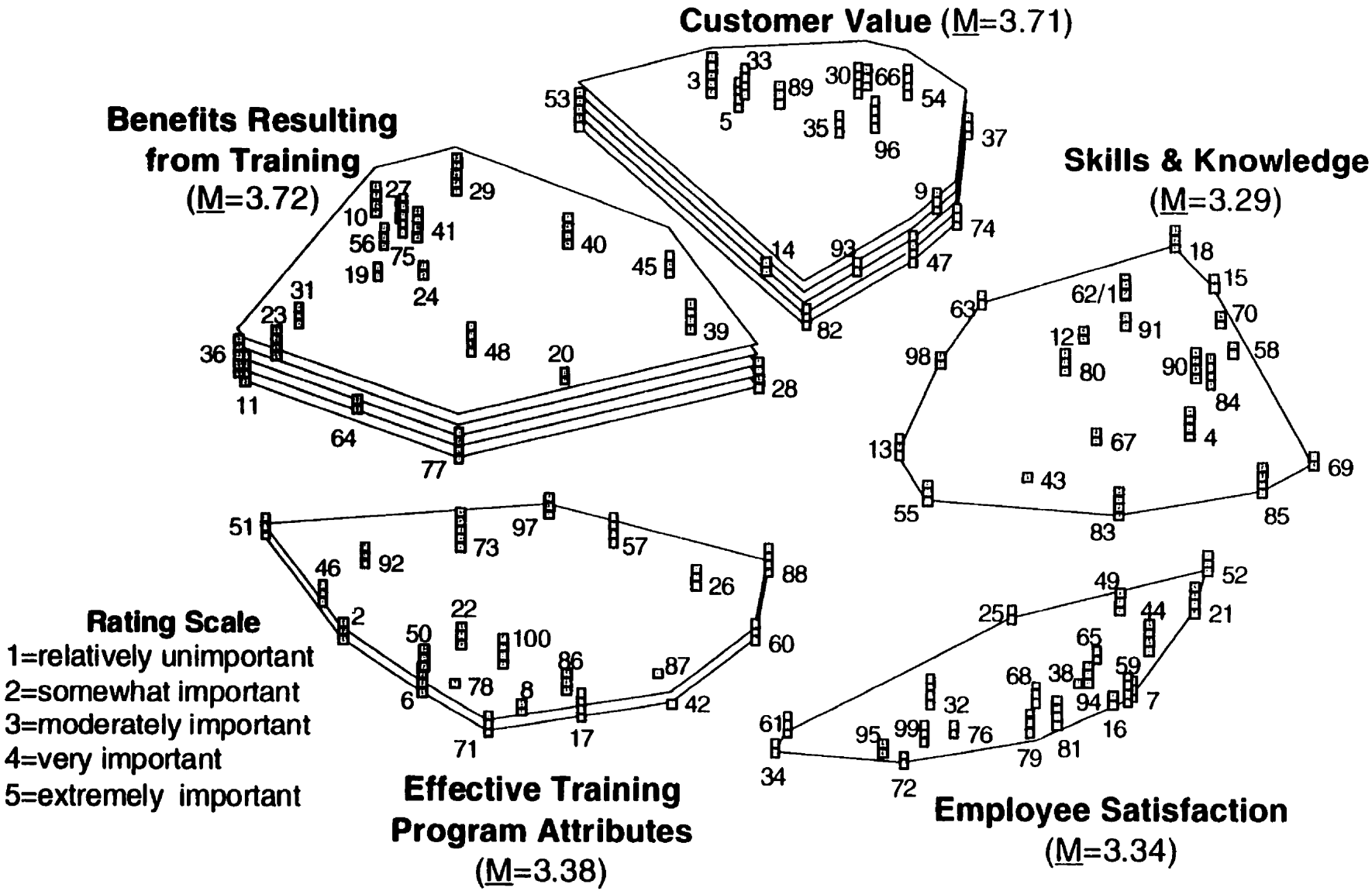

Figure 4. Training provider group training result importance concept map.

Examples include (#42) increase relevant training days per staff (M=2.00), (#38) employee professional/educational credentials are better recognized (M=2.31), (#34) employees say "there's [sic] so many good courses and so little time" instead of "are there any courses I should take?" (M=2.62), (#72) employees look forward to training to learn something new and "neat" (M=2.69).

In rating the importance of these results in terms of TPE, the training provider group had a much different view. In sharp contrast to their rankings of the statements in terms of general (organizational) importance, training providers rated TPE importance much differently. In order of TPE importance, the average cluster ratings were (1) effective training program attributes (M=3.63), (2) skills and knowledge (M=3.46), (3) employee satisfaction (M=3.34), benefits resulting from training (M=3.25), (5) customer value (M=2.95). These results stand in stark contrast to the importance of the same statements as general training results. This contrast is quantified and depicted graphically as a pattern match within the training provider group as shown in **Figure 5**.

A negative cluster-level correlation (r =-.75) between the general and TPE importance ratings suggests that while the training provider group tends to view training as an important ingredient in benefiting the organization—especially in terms of contributing to customer value and satisfaction—they do not deem these same results to be similarly important in terms of training evaluation (TPE). Rather, as the ladder diagram shows, this group views the importance of the cluster statements as training results inversely compared with rankings of the same cluster statements in terms of TPE importance. Included in the "effective training program attributes" cluster are those statements strictly referenced to training, teaching, learning, and the integration and improvement of such.

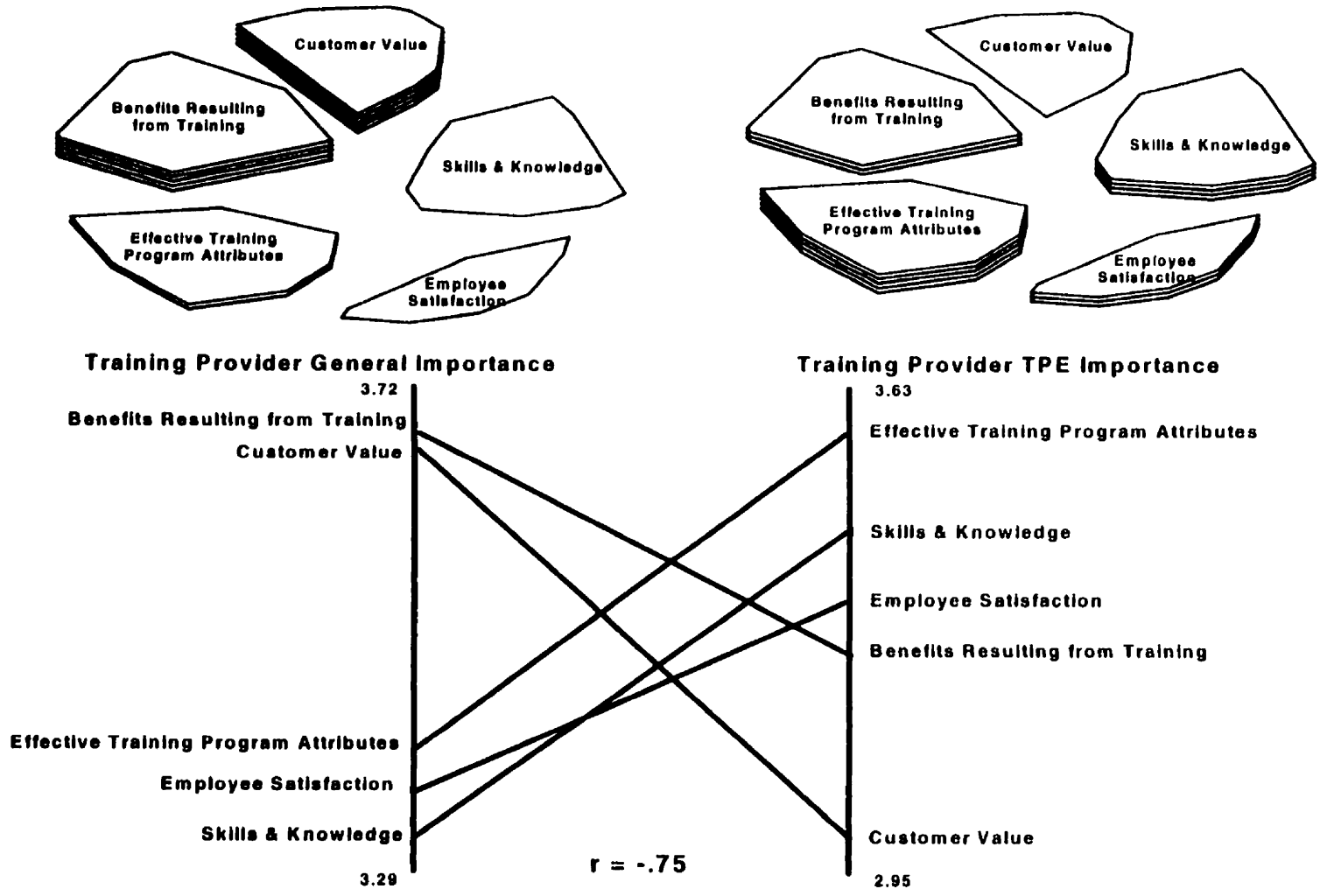

Figure 5. Intra-group training provider pattern match for training result vs. TPE importance.

By considering this conceptual cluster to be highest in TPE importance the training provider group seems to view training evaluation as somewhat parallel to the evaluation of their own performance in delivering these results as program providers. In other words, these criteria are much more closely tied to program development and delivery than the other training program results.

Sponsors

A prominent result reflected in the (training program) sponsor group map is training as a contributor to profitability through customer satisfaction. This group chose to settle on the default number of six conceptual clusters for their map. **Figure 6** shows the concept map produced by the sponsor group.

The six clusters ranked in order of average general importance are (1) customer and market (M=4.22), (2) product development (M=3.71), (3) collaboration and knowledge alignment (M=3.59), (4) employee development (M=3.50), (5) organizational/corporate (M=3.46), and (6) training-learning integration (M=3.02). The top two conceptual clusters emphasize this group's close organizational proximity to the interface between external customer and internal product development and staffing priorities. Among the statements ranked highest in general importance by this group were (#75) reduced time to market (M=4.77), (#30) ability to meet/anticipate customer requirements (M=4.62), (#96) improve ability to turn product capabilities into value for the customer (M=4.46), and (#81) attracts/retains key employees (best & brightest); develops employee loyalty (M=4.46). In contrast, the statements ranked lowest by this group included those which do not directly or immediately relate training to product development or customer satisfaction.

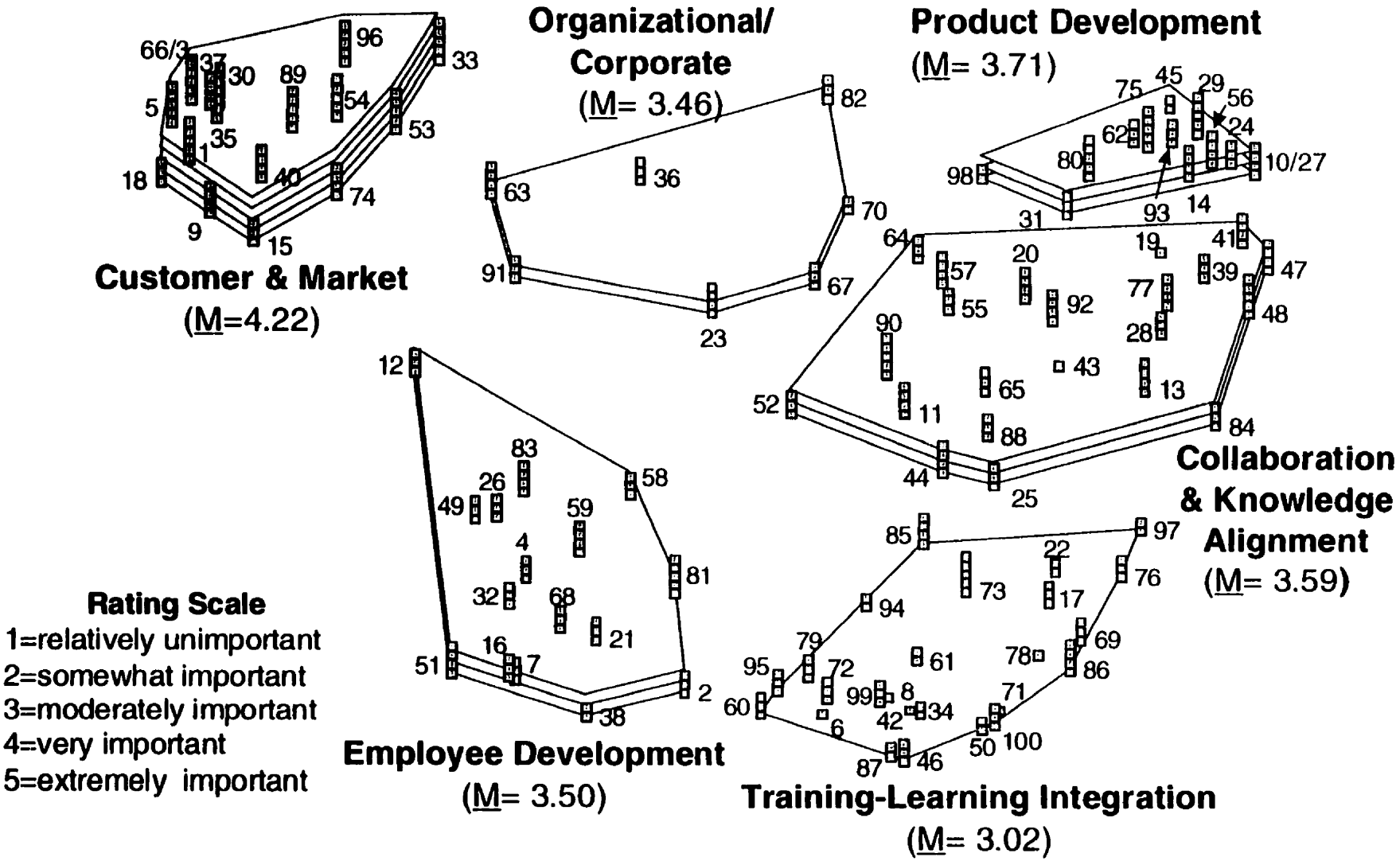

Figure 6. Line sponsor group training result importance concept map.

Examples, include (#8) training is integrated with university-industry interaction programs (M=1.92), (#6) individual learning style(s) are addressed by optimization of learning media (M=2.31), (#42) increase relevant training days per staff (M=2.38). (#94) employees get credit/acknowledgment/ rewards for their learning achievements (M=2.62), and (#61) employees have increased control of their training and knowledge resources (M=2.77).

Program sponsors tended to rate statements for both general and TPE importance in a much more concordant manner than training providers. Statements comprising the "customer and market" cluster were rated highest in average general and TPE importance (M=3.46). This similarity is summarized by a fairly strong positive intra-group pattern matching correlation coefficient (r =.74). A particularly notable difference is that, rather than ranking "product development" next in importance for TPE, "employee development" (M=3.35) is ranked second overall. This result indicates support for management's perception of training evaluation as instrumental to develop the employee (at least to the extent required to ensure effective product development). This is discussed below more completely in reference to the employee (knowledge worker) system of expertise in the organization.

Trainees

The participant/trainee concept map is shown in **Figure 7**. This group produced the most highly-defined map which included nine conceptual clusters. In order of general importance these were (1) design quality (M=3.88), (2) customer and market orientation (M=3.68), (3) project preparedness (M=3.40), (4) employee satisfaction (M=3.39), (5) people management (M=3.38), (6) process awareness (M=3.35), (7) organizational training support (M=3.28), (8) business management (M=3.15), and (9) learning improvement (M=3.14).

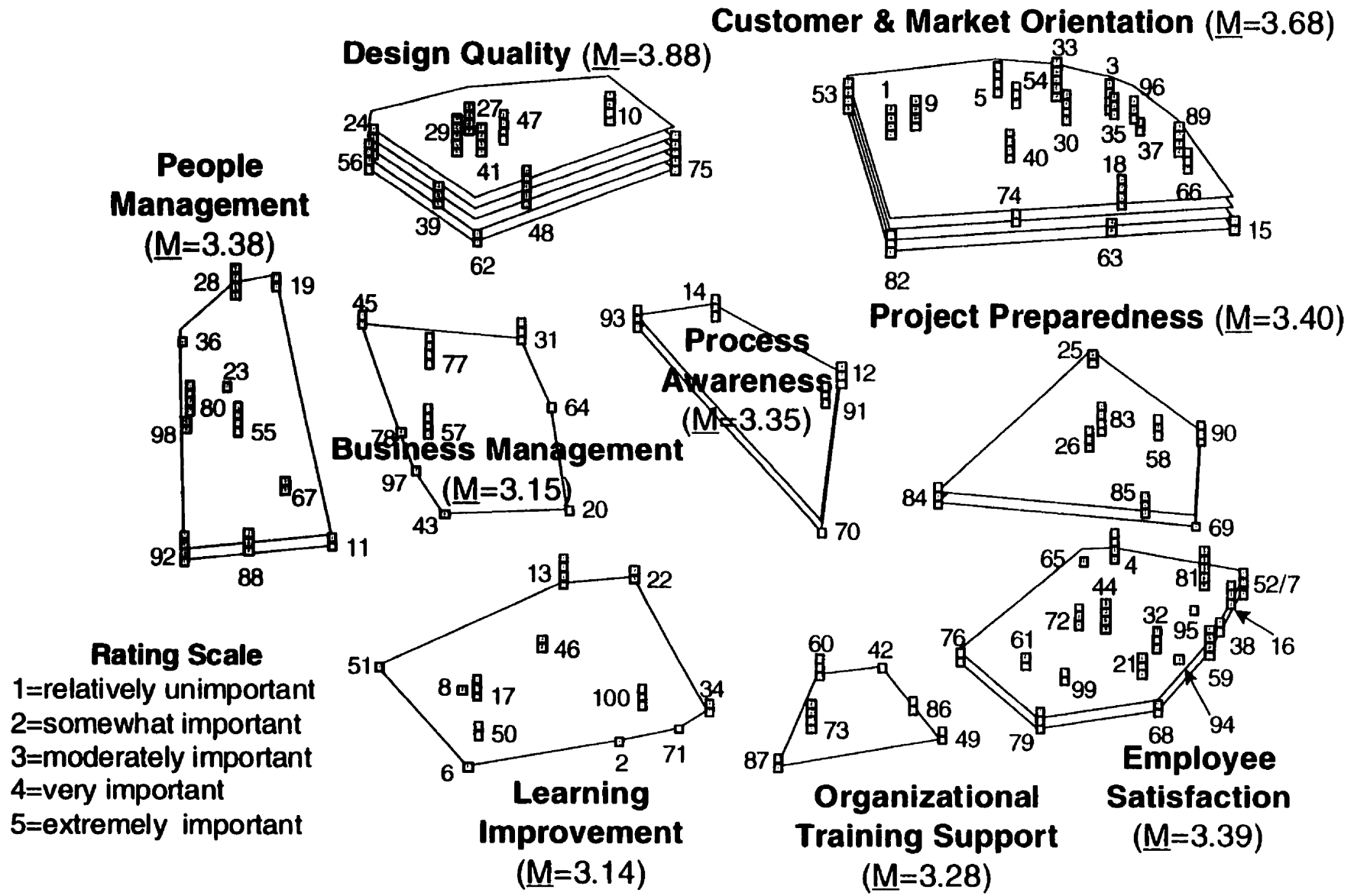

Figure 7. Participant/trainee group training result importance concept map.

The results of this group emphasized the project-driven job perspective of the designer/developer, particularly in terms of design, customer, and quality processes. Both of the top two clusters contain statements that emphasize the essential role of this group's expertise as core knowledge workers in the organization. These results suggest that this group views itself as a main vehicle toward achieving many of the organizational results with training acting as a catalyst. Individual statements ranked highest as general training program results in average importance were (#81) attracts/retains key employees (best & brightest); develops employee loyalty (M=4.46), (#29) significant product quality improvements (M=4.31), (#48) less time correcting mistakes/fewer recurrent problems (M=4.23), and (#75) reduced time to market (speed deliverables, reduce design cycle times) (M=4.23). Among the statement ranked lowest in general importance were those emphasizing more bureaucratic or managerial themes. These include (#78) attain training program compliance with standards (M=2.54), (#43) contribute to line management perception of staff project preparedness (M=2.54), (#42) increase relevant training days per staff (M=2.62), (#51) faster transition to 90% effectiveness for new managers (M=2.69), (#69) obtain "certified" special skills (M=2.77), and (#23) support key performance plan of organization (M=2.77).

Participants/trainees also rated the statements for general and TPE importance more closely than training providers. Parallel to the general importance ratings, statements in the "design quality" cluster were also ranked first in TPE importance (M=3.64). "Project preparedness" (M=3.42) and "process awareness" (M=3.25) were next in TPE importance. An examination of the statements in these clusters demonstrates that this group values training program results in terms of outcomes that contribute directly to and support the employee (knowledge worker) system of expertise in the organization. In contrast to the training provider

group (but similar to the sponsor group), the participant/trainee group rated general and TPE importance in a fairly analogous manner. The participant/trainee intra-group pattern match shows a positive correlation (r =.65) between general and TPE importance. This result is particularly notable for several reasons. Both stakeholder groups from the customer/client organization conceptualized the results of training and the evaluation of such as being much more closely aligned in contrast to the training provider group. Although there were differences in how both training customer stakeholder groups viewed training results in terms of their own roles in the organization, both of these groups generally expect training to be evaluated in terms of how well it helps to deliver these same results. As shown earlier, the training provider group perceived much larger differences between general and TPE importance. Both customer groups showed much better agreement between how they conceptualized general and TPE importance results relative to the training provider group as based on the pattern match correlation coefficient values. These contrasts and comparisons are next examined more closely across the three stakeholder groups using pattern matching analysis.

Intergroup Pattern Matching Results

As demonstrated, pattern matching techniques were used to explore stakeholder differences in perceptions about the importance of training results and training evaluation. A total of 21 inter- and intra-group pattern match correlation coefficients was obtained from the analyses performed. The 18 intergroup pattern matches compare average cluster importance ratings of the initial group who produced the map with the average importance ratings of the same set of statements as assigned by members of the other groups. Three additional intra-group matches compare how each group rated the importance of the same statements in terms of training result—versus training evaluation—importance. A side-by-side examination of these

coefficients is useful to reveal and quantify variation among the stakeholder groups. **Table 4** presents the pattern match correlation coefficient values for general (G) and TPE (T) importance among all three stakeholder groups. The ladder diagrams for all 21 pattern matches is shown in **Appendix J**.

Compared with the other two stakeholder groups, training providers demonstrated the strongest contrasting views regarding the evaluation of training results. Table 4 shows fairly good agreement on the general importance of training results (G-G) among all groups with correlations $\underline{r} \geq .73$ (with a range of .73 to .90). Positive pattern match correlations were also obtained for comparisons of general to TPE importance (G-T) for all groups (range .24 to .74) except in those comparisons involving the training provider group. The strongest negative intergroup correlations occurred between the training providers and both other groups in pattern matches comparing general to TPE importance (G-T) and TPE to TPE (T-T) importance. For example, comparing the sponsor general importance ratings (G) to the TPE importance ratings (T) assigned by the training provider group, a pattern match correlation of $\underline{r} = -.94$ was obtained. This same comparison (G-T) between the participant/trainee and training provider groups yields a pattern match correlation of $\underline{r} = -.40$. An intergroup comparison between the sponsor and training provider groups for TPE importance (T-T) shows a pattern match correlation of $\underline{r} = -.57$. The only negative correlation ($\underline{r} = -.28$) obtained between sponsors and participant trainees was for TPE importance (T-T). This result demonstrates variation among these two groups specifically regarding training evaluation. The implications of such variation are discussed next.

Table 4. Pattern Matching Correlations for General (G) and Training Evaluation (T) Importance

	Inter-group Pattern Match Correlation Coefficients (r)								
	Training Provider			Line Sponsor			Participant/Trainee		
Stakeholder Map	G-G	G-T	T-T	G-G	G-T	T-T	G-G	G-T	T-T
Training Provider	--	-.75	--	.78	-.01	-.37	.81	.48	-.12
Line Sponsor	.87	-.94	-.57	--	.74	--	.80	.24	-.28
Participant/Trainee	.73	-.40	.17	.90	.49	.58	--	.65	--

Note. All correlation coefficients are from cluster-level pattern matches of statement importance ratings in reference to the primary stakeholder maps (column). Each correlation relates the average cluster importance of statements in the primary stakeholder map to the average importance of the same statements as rated by the other two stakeholder groups.

Implications

There were both commonalties and differences in the way the groups conceptualized training results. Common map features included external and internal aspects of the organization associated respectively with the customer and the employee (particularly in terms of employee satisfaction). Regarding the predictions made (see Table 1), there were several statements that referred to traditional training results in terms of cost (e.g., statement #31-reduced cost of operation internally, #46-realize increasingly cost effective training). However, no stakeholder group or individual statement specifically stated that training should be evaluated in strict financial terms of ROI. Also each stakeholder group conceptualized these cost-related statements quite differently. For example, statement #31 about internal cost reduction was conceptualized in the "benefits resulting from training" cluster by the training provider group. The same statement was conceptualized in the "product development" cluster by the sponsor group, and in the "business management" cluster by the participant/trainee group. Rather than conceptualize cost reduction as the direct "result" of training, both of the two latter groups included the statement in clusters characterizing it more as an indirect result in terms of emergent, rather than traditional, indicators of training program results.

The differences between the group maps tend to relate well to the role of each group in the organization. Training providers, although showing strong negative (inter and intra) pattern matches for general and TPE importance did show fairly strong positive intergroup pattern matches for general importance alone (all $\underline{r} \geq .73$). This can be attributed to this group's strong alignment with the goals and values of their internal (management and participant/trainee) clients. The general importance of training results was conceptualized by this group in a way that both emphasized their involvement in key organizational results and highlighted the value of

their services as organizational support staff. The statement ranked highest overall by this group in general importance was statement #3—support customer's strategic and operational objectives (M=4.85). In terms of organizational power dynamics this result fits quite well with Mintzberg's (1983) description of professional support staff tendencies to align with and support what they perceive to be the top goals and priorities of management.

But, while ostensibly wanting to be perceived as collaborating with other stakeholders to help bring about positive organizational results (via training), the training provider group does not seem to favor being seen as exclusively accountable for delivering these results by training alone. The (G-T) pattern matches mentioned for the training provider group are most revealing. These pattern matches suggest that training providers would support a more evidence-based and less mechanistic (cause and effect type) training evaluation model. This is ostensibly based on the provider group's more acute ability to recognize (particularly relative to the other two stakeholder groups) the complexities of "proving" training's contribution in a complex organizational setting. This result corresponds well to McLinden's (1995) conclusions about proof, evidence, and complexity in understanding the impact of training in business:

> Specifically, studies that are designed to focus solely on the extent to which interventions affect bottom-line indicators ignore the way organizations work. That is, a myriad of other effects can occur between the intervention and the measurement of an effect on fees, profits, customer satisfaction, and other indications. Disentangling the myriad variables, isolating and unequivocally proving the single effect due to training, may simply not be possible. (p. 15)

Additional evidence of this can be seen by examining the statement ratings in the map clusters and pattern match shown previously in Figure 5. The cluster labeled "customer value" is a good

example. This cluster was ranked by the provider group second in overall general importance (by only .01 units less than the top-ranked cluster), yet was ranked lowest overall in terms of TPE importance. An examination of the differences in the individual statement ratings (e.g., #3, #30, #33, #47, #53) in this cluster supports the apparent training provider group belief that training contributes to—rather than causes—key organizational results. Because training providers seem to recognize that causal proof is effectively impossible to obtain regarding training's contribution, the same cluster statements that were rated high ($\underline{M}$ = 3.71) as generally important training results were rated much lower ($\underline{M}$ = 2.95) in terms of TPE. Hence, as professional support staff this group recognizes the political importance of aligning and collaborating with their customers but seems to be vulnerable and ever-challenged to produce appropriate indicators of training's contributions in doing so.

As participants in training evaluation, particularly in relation to the other stakeholder groups, the sponsor group is key precisely because of its power position in the organization. According to McLinden "The belief is that evaluation involving both those with substantial position power and those with close transactional proximity to the training is necessary to provide compelling evidence of strengths and weaknesses." (p. 13). The sponsors were much more consistent in how they rated both general and TPE importance. By far this group considered training results in terms of customer and market to be most critical as a general training result. In terms of TPE the statement ranked highest in average importance was statement #73—makes new people productive as quickly as possible (faster ramp-up, e.g., to 90% efficiency) ($\underline{M}$=4.08).

This outcome suggests a strong concern with organizational change and/or growth from the sponsor perspective. Assuming the need to bring in "new people" is not just to stem normal

employee attrition, the perceived importance for training to contribute to the productivity of new employees portends a concern with organizational growth—by definition, "new" employees are those brought in and added to the population of existing employees. This corresponds well with organizational power theory. According to Mintzberg (1983) this group (line managers) invokes power and political influence characterized by position power, budgeting discretion, and accountability (i.e., the system of authority). The needs of the line managers are reflected in two different forces; on the one hand, an identification with the CEO and his goals of survival and growth, especially at higher levels in the hierarchy, and on the other, an attempt to satisfy their own drives for autonomy and achievement through the aggrandizement of their own units and the balkanization of the overall structure. Both these forces, however, favor expansion of the organization at large, and so growth emerges—advertently and inadvertently—as the key goal promoted for the organization by the managers of the middle line.

Participants/trainees are the central or line knowledge workers in the organization. This group emphasized the importance of training results and evaluation mostly in terms of the practice of their profession in the organization. Therefore, concepts of design quality and project preparedness were considered as particularly important. As noted, this group constitutes the professional operators of the organization. Their power and political basis involves the system of expertise. Characterized by a normative reward system and high intrinsic satisfaction, the goals of this group involve protection and especially autonomy of the group. Beyond this the group would favor enhancement of the prestige and resources of the specialty and professional excellence (sometimes in spite of client need) and when client-professional relationships are close and personal, support of the organization's mission. As professionals, individuals in this

group tend to take pleasure in their work and were expected to place a higher relative value on TPE indicators related to their own career and professional growth and job satisfaction.

Phase 1 Limitations

Several limitations should be noted. Most of these limitations involve sampling, reliability, and validity issues associated with the concept mapping process and methodology employed. First, there is a limitation related to a lack of similar empirical studies for comparison.[14] As noted the concept mapping process typically involves 15 or so individuals to brainstorm, sort, rate, and interpret a single concept map. As noted there have been a good number of published studies that have described typical concept mapping projects as single group-facilitated sessions; however, none of these used the exact approach adopted for the present study. For purposes of the present study, a total of 39 individuals organized into three groups of 13 each were involved in brainstorming, sorting, rating, and interpreting the concept maps. As noted, rather than attempt to grapple with the technical intricacy involved with comparing group maps produced from different statement sets[15], the set of brainstormed statements produced by each group individually were combined by the researcher into a single set for subsequent structuring by each group. While this approach did allow for the straightforward calculation of the three group maps and the calculation of pattern matches, it seems intuitively obvious that some relative group emphasis was lost. In other words, it would be interesting to compare three concept maps produced by the same stakeholder groups as completely independent projects (using separate brainstormed statement sets). This, however,

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[14] Theoretical/conceptual studies have only very recently begun to emerge. See, e.g., McLinden and Trochim (1998).

[15] A problem worthy of research in its own right and not yet well discussed in the literature.

would have to be a qualitative comparison and would not allow for the calculation of pattern matching coefficients.

A second limitation has to do with sample representativeness and generalizability. Being a single case study performed at a localized site, the sample of individuals involved was necessarily restricted. Furthermore, the total local training provider population was relatively small in comparison to the total populations of the other two groups. Also, because all of these populations were organizationally nested within a much larger company, the results obtained in the case organization cannot be confidently generalized to the company at large. Beyond this, repetition across a larger number of cases would augment the results obtained.

A third limitation concerns the reliability of concept mapping itself. Trochim (1993) has noted that the traditional theory of reliability typically applied in social research does not fit the concept mapping model well because that theory assumes that for each test item there is a correct answer that is known *a priori*. The performance of each individual is measured on each question and coded correct or incorrect. Data are typically stored in a rectangular matrix with the rows being persons and the columns test items. In this frame, reliability assessment focuses on the test questions or on the total score of the test so that the reliability of these can be meaningfully estimated. According to Trochim, concept mapping involves a different emphasis altogether. There is no assumed correct answer or correct sort. Instead, it is assumed that there may be some normatively typical arrangement of statements that is reflected imperfectly in the sorts of all members who come from the same relatively homogeneous (with respect to the construct of interest) cultural group. The emphasis in reliability assessment shifts from the item to the person. For purposes of reliability assessment, the structure of the data matrix is reversed, with persons as the columns and items (or item pairs) as the rows. Reliability assessment focuses on

the consistency across the assumed relatively homogeneous set of participants. In this sense, it is meaningful to speak of the reliability of the similarity matrix or the reliability of the map in concept mapping, but not the reliability of individual statements.

Phase 1 Summary

In reference to the first research question, this phase has produced evidence of perceptual variation among stakeholder groups regarding training results and their evaluation. Concept mapping and pattern matching revealed that, while all groups agreed reasonably well about the general importance of training results based on pattern match correlations (all $\underline{r} \geq .73$), progressively larger variation was found in terms of group perceptions related specifically to these same results in terms of evaluation (TPE) importance. It was this dimension that showed the greatest amount of difference among the stakeholders. These findings suggest that while all stakeholders seem to agree about training results in the organization, there is much more variation in the importance each group ascribes to these same results in terms of training evaluation. While a negative correlation ($\underline{r} = -.28$) was observed describing sponsor versus participant views of TPE, the training provider group was most divergent in this respect as evidenced by low and negative pattern matching correlation coefficients describing the importance of both general and TPE results compared with the other two stakeholder groups. As discussed such variation corresponds with and supports characterizations of the stakeholder groups in terms of organizational power theory in view of their respective functions, roles, and responsibilities. The presence of organizational politics in training program evaluation was supported but requires further exploration. By addressing the second research question related to the influence of stakeholder perceptions of training results on their views about training evaluation, the phase 2 research was particularly useful in further exploring and explaining the

phase 1 findings. The phase 2 (interviewing) results are presented and discussed in the following chapter.

Chapter 5

Phase 2: Interview Results

In view of the phase 1 results described, the interview research was designed in specific reference to research question two. To review, the phase 1 investigation involved a total of 39 participants in the three stakeholder groups who constructed concept maps to describe at the group level "specific training program results that would contribute to the success of [the organization] over the next 12 to 24 months." As discussed in the last chapter, although relative homogeneity across groups was found in terms of training program results, greater intergroup variation regarding training program evaluation was revealed. The most pronounced differences were found regarding training program evaluation between training providers and both training client (sponsor and trainee) groups. The present phase of research was designed to augment and extend the findings obtained in phase 1 by focusing on whether stakeholder views of training program evaluation depend on the results they perceive for the program.

Most of the interviews were approximately 1 hour in duration; however, they ranged overall in duration from 0.5 hour to 1.5 hour. While this 1 hour range at first appears extreme, in retrospect it seems reasonable based on the fact that these were single instances. The 0.5 hour interview occurred with a relatively new (less than 5 years experience) designer who was not very opinionated regarding training (since this was not his area of expertise). The 1.5 hour interview occurred with the very opinionated director of the training provider group who had nearly 30 years experience with the company.

The maximum number of transcribed pages for a single interview was 15 single-spaced pages of raw text. The 15 interviews transcribed to a total of 841 text units (a text unit is defined as the smallest portion of a document coded for analysis). The average interview was 56 text units in length (SD=11.28). As discussed in Chapter 3, all text was coded and analyzed using QSR NUD-IST (4.0) software.

Background and Demographics

Interview participants were familiar with the general background and purpose of the interviews from their participation in the prior concept mapping phase described. As noted in Chapter 3 eight interviewees were selected at random from the list of phase 1 participants and invited to be interviewed. Five members of each of the three groups participated.

As shown in **Table 5**, all three groups had similar demographic representation based on age, gender, years in company, years in current job, and job classification (band) level. Only one individual indicated his age to be less than 30 years; seven of the individuals indicated their age in the 30 to 39 year range; four in the 40 to 49 year range; and three in the 50 to 60 year range. Thirteen of the study participants were male and all but one participant indicated being with the firm at least 3 years. Five participants indicated more than 10 years with the company.

Table 5. Demographic Base Data for Interview Sample

Stakeholder Group	Age	Gender	Time in Company (years)	Time in Job (years)	Job Band Level[a]
provider	30 to 34	male	3 to 4	3 to 4	6
provider	30 to 34	male	6 to 10	3 to 4	7
provider	30 to 34	male	3 to 4	< 1	7
provider	40 to 44	female	> 10	1 to 2	8
provider	50 to 54	male	> 10	3 to 4	9
sponsor	35 to 39	male	> 10	6 to 10	8
sponsor	35 to 39	male	6 to 10	< 1	7
sponsor	45 to 49	male	> 10	3 to 4	7
sponsor	45 to 49	male	> 10	1 to 2	9
sponsor	50 to 54	male	> 10	6 to 10	10
trainee	25 to 29	male	3 to 4	1 to 2	5
trainee	30 to 34	male	4 to 6	3 to 4	6
trainee	30 to 34	male	1 to 2	1 to 2	5
trainee	40 to 44	male	3 to 4	3 to 4	5
trainee	55 to 60	female	1 to 2	1 to 2	6

[a] An internal human resource designation related to job classification and coinciding with hierarchical position in the organization. Bands 7 and above are management-level positions.

Training Result Perceptions: Concept Map Verification

This section corresponds to questions contained in the first part of the interview guide related to individual views of training program results and concept map verification. All individuals generally agreed with the training program results as displayed on their respective group's concept map. Although there was variation across the groups in both the number of conceptual clusters, specificity, and cluster titles, all three stakeholder groups commonly recognized a role for training in contributing to customer and employee satisfaction. Several major themes pertaining to training program results emerged for each stakeholder group. **Table 6** contains a summary and comparison of training program results by group. These results are presented next.

Providers

General individual agreement was evident among members of the training provider group supporting their group's concept map showing training program results obtained in phase 1. The following comments are representative of others obtained in response to the first set of interview questions:

- So I think this [concept map] represents my view fairly well in that it's the end goal, the end results of training that we are trying to identify, and what those might be.
- I think it is as though this map was my map.
- So I agree with that....It really presents everything that you need to capture with training impact.

Table 6. Stakeholder Perceptions of Training Program Results

	STAKEHOLDER GROUP		
	Providers	Sponsors	Trainees
Training Program Results Perceived by Group[a]	•benefits resulting from training •customer value •effective training program attributes (optimized learning media, needs assessment processes; mentor development; training-job integration) •employee satisfaction •skills & knowledge	•customer and market •product development •collaboration and knowledge alignment •employee development •organizational/corporate •training-learning integration	•design quality •customer and market orientation •project preparedness •employee satisfaction •people management •process awareness •organizational training support •business management •learning improvement
Individual Agreement with Group	strong evidence	strong evidence	moderately strong evidence
Major Themes	•Internal training customer satisfaction (sponsors, trainees) •Technical training as an organizational imperative •Perceived program worth •Demonstrating employee productivity and satisfaction through program participation	•Training program results as prerequisites to business performance •Interrelationship between customer and employee satisfaction •Training to keep employees current with technology and market directions •Duality of training goals in terms of job-specific versus professional and personal employee objectives	•Professional and career development •Relation of employee professional and career development to employee satisfaction •Technical skills and knowledge related to the job at hand •Tension between training for (current) job-specific, and (longer term) developmental results

[a] concept map main cluster titles (descending order of average importance) for training program results as defined by each stakeholder group

Similar to members of the other two stakeholder groups (discussed next), program providers described training program results in terms of employee and customer satisfaction. As discussed later in this chapter, however, larger differences were seen in how providers viewed the evaluation of training relative to such results.

In connection with this it is important to distinguish this group's use of the term of "customer" as compared with the other two groups. Whereas the program sponsor and the trainee groups use the term "customer" to refer to external entities in a business sense, program providers recognized these external customers but also used the term to refer to their internal training clients (program sponsors and participants). This usage was reflected in the emphasis training providers placed on job-specific technical training, and by their tendency to use evaluation results as a means to promote training as an essential ingredient for external customer satisfaction and business success. Consequently, members of this group emphasized technical training as an organizational imperative for job productivity, customer, and employee satisfaction as indicated by the following comment:

> The relationship in my mind is that training will build skills and knowledge, that will result in customer value. At the same time it will result in [employee satisfaction] because you are valuing [the employee by investing in them]. So you are building [employee] skills and making [employees] more marketable, so that will affect [employee satisfaction]. As a result of this, the effectiveness of [these] skills and knowledge will have an impact on [the employee's] job.

Other members of the training provider group likewise described training program results in terms of external customer value achieved through employee productivity and

satisfaction. As noted, however, this was done in clear reference to also achieving internal client satisfaction, particularly in terms of satisfying case organization management and program sponsors. Views express by members of the sponsor group are presented next.

Sponsors

Individuals generally agreed with the conceptual clusters of training program results displayed on the concept map produced by their group as illustrated by the following individual sponsor comments:

- Looking at what you've got here right now, it does resonate [with] what I recall from my own set of groupings...It's quite aligned with how I would group things.
- There is nothing that obviously sticks out as missing. I mean, our focus is obviously on customers and market in order to be successful as a company, so anything that leads to that has got to be the right thing.
- I think they [concept map results] relate quite closely, certainly the concept of understanding the customer and the market and where the technology and the market and all those things are going, that to me is a very important aspect.
- I think that the weights of these boxes [concept map cluster importance stacks] look about right. The right areas have been hit.

Commenting on training results, sponsors also indicated a recognition of the interrelationship and importance of external customer and employee results especially in the context of product development and organizational and corporate performance. Rather than discuss training results solely in traditional financial or business performance

terms, however, program sponsors generally focused on training program results as prerequisites for such performance. An example is training's role in keeping staff current and up-to-date in technology and market directions. The comments of one program sponsor—a manager of a hardware development group—are representative:

> It has come out in the hardware training needs assessment as well, it is one of the recurring themes. Where is the market going? Where is [the case organization] going? How do we make use of the technology? What is happening with data? What's happening with IP [internet protocol]? What is happening with the traditional networks, where are they going? So that is definitely very important, and unless we know where to go, we won't get there.

Program sponsors further emphasized training-learning integration in distinguishing between training to directly support an employee in a current job assignment and training for professional or personal development. Referring to this distinction, sponsors supported a wide range of training along a continuum of purely job-specific to purely developmental and personal training. The rationale for this was that job-specific training is obviously important in the short term to meet project deliverables for customers, but developmental and personal training was at least as important for the longer term growth, satisfaction, and (ultimately) retention of the employee. The following sponsor comment illustrates:

> So the employee development, focusing it into those two angles, really helps to develop the individuals to what we need them to be. That's something that the individual has to recognize too. As managers we can help them by sitting through the MFA [annual personnel performance review] process, looking at this kind of

training and that kind of training. It's both of them. So you can't just think, "Well, I only want to take a bunch of technical courses." It's much beyond that. Such comments demonstrate a recognition of the difference between knowledge and skills imparted and intended to be used immediately on the current job as training, versus those intended for enrichment and growth of the employee as education or development. Employee development is seen as particularly important in terms of the general satisfaction of those more experienced employees who have ostensibly learned what is required for most entry-level positions. Hence, program providers view training program results strongly in terms of employee skill and longer-term knowledge development and expect reciprocal benefits through, for example, improved product development, customer and employee satisfaction, and overall business performance. As discussed next, program participants had similar views but, as employees, they are more tightly focused at the project level in terms of product development and their own self-perceived training and development needs.

Participants

As knowledge workers mostly in the hardware and software design fields, training participants (trainees) also generally agreed individually with their group's concept map as indicated by the following individual comments:

- I think it's [concept map] pretty accurate as far as my understanding and my impression of the training organization. As far as my requirements and where I think the training organization should go as far as training for a designer at my level.

- As I've already indicated, a lot of the map goes back to a wish list and not what the training should be. So it maps it somewhat but not completely.
- I almost totally agree with that partitioning. Process is something; project preparedness is another thing, which is actually part of the training, and should be actually part of the training especially at [the organization].

As mentioned, trainee views of training results were similar to those of program sponsors but at a lower level. Trainees described program results specifically in terms of their own professional and career development yet also recognized a bigger organizational picture involving, for example, external customer satisfaction, organizational, and management issues. The comments of one designer exemplify how training supported him "...in doing the design well, because you don't work only for money [but for] professional improvement which leads to satisfaction". But, while being aware of potential benefits of less technical training, trainees placed a higher priority on job-specific, technical rather than less technical (soft-skills) knowledge and skills. The following trainee seems almost apologetic in expressing his priority for such training:

> One thing that I do know is that certain aspects like this [employee satisfaction] and people management...I haven't taken courses like "7 Habits of Highly Effective People"...non-technical courses that really contribute to my effectiveness as a team player or my growth as a leader in the organization. However, they are lower on the totem pole as far as getting my job done.

Another designer, who was also in the midst of a transition from a non-management design role to a design management role, was more emphatic in stating his view that

training should be exclusively oriented toward job-specific knowledge and skill development:

> I think a training program is a very personal thing. We've been training all our lives (i.e., we go through school, we get courses, we read books), and a lot of that is done by ourselves. What the training program should do here is provide us with the basic tools that are required to get the job done. And that should be it. Basically, what we are doing in our field and none of the extra curricular stuff that people want to put in there as a wish list for [employee satisfaction] and stuff.

This individual indicated moderately positive support for the participant/trainee group's concept map. Although just making the transition into management, his views contrast with those of the more experienced managers (in the program sponsor group presented earlier) all of whom had been in a managerial role much longer. This person viewed effective training as that which could be shown to directly support job-specific design and product development processes. This view echoes other participant comments describing a perceived "tension" between immediate, job-specific, and longer-term developmental training program results among participants. Beyond that, however, this group generally described program results similarly to program sponsors by conceptualizing the ultimate results of training in terms of employee and customer satisfaction, product development, and general organizational performance improvement.

Training Program Results: Intergroup Comparison

Looking across the stakeholder groups it is worthwhile to note several points. First, because each person interviewed participated in constructing their respective group map, the strong individual support demonstrated is not surprising. Second, all groups

discussed satisfaction of both customers and employees, although there were differences in both definition and emphasis in these areas. Third, both program sponsors and participants conceptualized training results predominantly in terms of external customer satisfaction. Training providers also recognized these external customers but were most keenly concerned with the satisfaction of their internal training customers (i.e., program sponsors and participants). In this sense the program provider group was most directly concerned with internal and less directly concerned with external customer satisfaction as a program result. Program participants discussed results mostly in terms of developing their professional careers and technical knowledge and skills. Program sponsors exhibited the most integrated view in discussing the interdependencies of training results as a balance of business, customer, and employee performance.

These results correspond well with those of the previous study phase. In reference to the predictions made (see Table 1) the results suggest that rather than focusing on training program results directly in the traditional terms indicated, program sponsors are interested first in more emergent results (e.g., customer and employee satisfaction) as prerequisites to more traditional business results. Program providers largely mirrored this view while also emphasizing the role of the training program in contributing to both traditional and emergent results. As predicted, trainees emphasized largely emergent indicators related to their role and professional growth and development.

Evaluation Result Perceptions

Stakeholder group views about the purposes, processes, and consequences of training program evaluation are presented next. **Table 7** summarizes and compares these views across groups.

Purposes

Stakeholders discussed the purposes for evaluation in a range of formative, summative, and mixed terms. Program sponsors described evaluation purposes mostly in formative or mixed formative-summative terms. The following comments are representative:

- I think that improvement is a much more positive angle. Judgment is kind of saying, "well we experienced this set of training and now we are going to decide whether it is good or bad." It doesn't imply any forward movement in terms of taking that value judgment and doing something with it.
- The next step is to determine ways to improve what we have ...I mean, yes we need training, so we need it. So who cares whether it's good, bad, or indifferent, just make it better and let's deliver it...so I think the evaluating is contained in the determining ways to improve it.

Trainees, having most direct program exposure at the course level, exhibited a more mixed formative-summative view of evaluation purposes:

- I would definitely say that it is a mix of both....You can't really make a suggestion for improvement without criticizing or judging that one part of it, and you can't really judge it unless you think there is room for improvement someplace.

Table 7. Stakeholder Perceptions of Training Program Evaluation

Group	Training Program Evaluation Purposes	Processes	Consequences
Sponsors	**PPP (strong positive)** formative **PP (moderate positive)** mixed **NN (moderate negative)** summative	**PPP (strong positive)** sponsors as primary users trainees as data sources survey data & analysis report to all stakeholders, brief format **PP (moderate positive)** providers as users for program improvement qualitative data (interview, focus group) **N (weak negative)** report results using web **NNN (strong negative)** long detailed report	**PPP (strong positive)** instrumental utilization -improve program **PP (moderate positive)** symbolic utilization -enhance program credibility both above and below in the line organization hierarchy -encourage program participation among employees
Trainees	**PP (moderate positive)** mixed (formative-summative) **P (weak positive)** summative (course level evaluation)	**PPP (strong positive)** trainee & sponsor involvement survey data & analysis report to all stakeholders, web format **PP (moderate positive)** provider involvement **NN (moderate negative)** report results using e-mail	**PPP (strong positive)** instrumental utilization -assist employee course selection -support professional development **PP (moderate positive)** conceptual -educate providers to improve program
Providers	**PPP (strong positive)** mixed (formative-summative) **PP (moderate positive)** summative	**PPP (strong positive)** provider group to initiate and lead evaluation sponsors as information sources to frame evaluation survey data & analysis selective reporting to all stakeholders, brief format **PP (moderate positive)** trainees as information sources during evaluation qualitative data (interview, focus group) **P (weak positive)** knowledge testing selective reporting using web **NN (moderate negative)** long detailed report for a single audience	**PPP (strong positive)** instrumental utilization -sustain program -evolve program -secure program funding -advertise training **PP (moderate positive)** symbolic utilization -highlight program success -demonstrate program value -demonstrate training expertise

- I think it's both. By doing this, you get a feel of how we feel about the training program, so maybe you can improve what is there already and maybe you can say that it is not necessary and introduce something else.

Although also showing some support for formative and mixed views, training providers discussed their view of summative training program evaluation in connection with their perceived need to demonstrate program worth to sponsors:

- It's to make the decisions on the investment up front, if you have a limited amount of cash to invest. So to improve, very much so.
- Both....[the program] has to have a benefit. What is it worth to the organization? That's a judgment. So we are spending that much money on investing in your people for a reason. You need to know what that reason is. At the same time, how we can make it better. So you use it also to make it better....So judge and improve based on the evaluation.

The coding of stakeholder views of evaluation purposes in formative and summative terms facilitated the further exploration of stakeholder reasoning behind these views, particularly as related to the training program results described for each group.

The predicted relationships summarized (see Table 2) were only partially supported. Program sponsors, viewing training as a necessary organizational function (or perhaps a sunken cost in economic terms) tended to describe evaluation in more formative terms emphasizing program improvement. In correspondence with this group's perceptions of program results in emergent terms (as a prerequisite to traditional results as described) this group demonstrated a basic assumption that program must be maintained (at some

level). Given this commitment to sustaining the program, formative evaluation for improvement represents a most logical perspective.

Trainees, as direct program consumers with a somewhat narrower focus than sponsors, described overall program evaluation purposes in generally formative terms as predicted. This group also, however, tended to discuss specifically course-level evaluation in largely summative terms. This is explained by this groups high level of familiarity and experience with typical end of course evaluation forms, which are generally more summative (i.e., did the course accomplish its stated objectives).

Also as predicted, program providers described formative purposes but also emphasized more summative views to demonstrate program worth to sponsors for funding and budget decisions. The summative aspect of this group's perceptions can be further qualified by noting their particular interest in favorable summative results, namely those that can be used as evidence of program effectiveness as a basis of continued program growth.

Processes

Variations in group views of evaluation processes reflect each group's views of both the purposes and consequences of evaluation as well as the results of training specified by each group. Program evaluation processes are divided into the three categories of (1) planning and involvement (2) data collection and analysis, and (3) dissemination of results.

Planning and involvement.

Multiple stakeholder involvement was generally favored across the groups. Program sponsors expressed an interest in diverse involvement. In describing who should be involved they stated:

- The participants, [and].... managers [as] the people in the organization who are responsible for moving its capability forward. The people who deliver the training, in order to evolve a training event to make it better next time.
- The individuals themselves...the individual's manager...But the other ones could be catalysts for it, like the people who give the training have to respond to it in some way, improve it.
- The people who take the training.... Then of course, the training people from a "How do I best deliver it?" point of view.

To a large extent this group views the participants as the main program consumers seeing themselves (as management) primary evaluation users acting on behalf of training participants as their employees. Members of this group consistently mentioned the involvement of both trainees and sponsors. While there was also mention of program provider involvement this was more indirect and in some cases included suggestions to include other groups as well such as technical subject matter and evaluation experts:

> There could be another independent group of individuals who can provide input on what constitutes effective training. People who have enough knowledge of training techniques and training approaches to be able to advise the people who are trying to evolve the training as to what works and what doesn't, benchmarking if you like.

While one member of the training participant group stated that the evaluation process should include "The people being trained, the people who send people to be trained, and also the people providing the training, because all three are interrelated", as a group, training participants discussed evaluation planning and involvement in terms of themselves, program sponsors, and to a lesser degree program providers. Members of this group, as the main program consumers, see themselves mostly as information and data sources during the evaluation. This agrees with the program sponsor view described. Trainees view themselves and their management as most relevant in the evaluation process. In one exception a designer expressed a lack of confidence in management in the evaluation process by stating "I don't have much of an idea of how the managers are evaluating the training process." A different designer flatly stated that training program providers need not be involved. The latter respondent indicated that highly experienced management (at least 10 years of experience) would be in the best position to undertake such commitments. As a recently promoted manager this particular individual was highly opinionated in his belief that management by committee just doesn't work and in expressing his perception of a need to take charge (ostensibly through some form of heroic leadership).

In contrast to the previous two groups, training providers view themselves as the main group to plan and execute the evaluation. While widely discussing a need to involve all stakeholders, this group saw evaluation both as a means of promoting their main service (training) as well as a potential way to offer a new and related service (evaluation) to internal organizational customers. An experienced senior training manager suggested that the program evaluation process should be the exclusive domain

of the training provider group and linked closely to existing training needs assessment services currently offered. In discussing evaluation planning and execution another training provider stated "I think that the training specialists have to drive it, absolutely." A main theme in this group's comments conceptualizes program sponsors as important information sources to specify the purpose, scope, and focus of the evaluation with trainees (participants) acting mainly as data sources in terms of the requirements specified by sponsors:

> I wouldn't want it to be left to me to try to tell them [program sponsors] what is going to be the benefit of this, I would like them to be able to work with me and decide. If [program sponsors] can tell me up front [what the goals of the program are] then we'll measure this...and come up with a way that we're both going to believe what we find out. So, number one, the sponsor has to decide with you. The sponsors and obviously the consumers [trainees] of it are going to be integral in making that decision, but I think the sponsor has to be the one to give you that end result. If [in the sponsor's view positive results are achieved] then you [provider] have done your job.

Data collection and analysis.

Moderate variation was found regarding program data collection and analysis. Program sponsors and participants were closely aligned in their views. Even while recognizing (or perhaps because of) the pervasiveness of traditional questionnaires, all groups generally emphasized surveys of the trainee population as foundational. The following sponsor comment is illustrative:

> I think survey forms are quite effective [although] there is a danger of being surveyed to death. But if it is a form that can be filled in quite quickly and with skillfully designed questions and multiple choice answers [and] if the words are phrased correctly and it can very easily key into potential answers that people will want to give, then it is quite an effective way to collect data quickly and efficiently.

In addition to survey techniques, there was also a general recognition of complementary or alternate methods such as interviews and focus groups. After reflecting on some of the problems he perceived in using survey data exclusively, a training program participant made the following comment:

> Maybe a mixture of a survey and group discussions....You would have a focus group of people that would be able to talk to each other, brainstorm, and send feedback directed to a specific area. I would capture that and then send it back as part of the evaluation.

Similarly, a program sponsor expressed his openness to alternative methods by commenting

> ...if it involves a large group and/or it's very critical, then probably the focus group type of approach comes into play there, because you are going to get more insight by having a group discussion than you are just asking people independently of each other to fill in a form.

While there was a general sense in both the program sponsor and participant groups that "evaluation data collection and analysis is not my strength or specialty" training program providers were much more comfortable discussing such. In addition to generally

mentioning survey techniques, this group favored data that produced what they viewed as hard evidence, such as test scores, to show training effectiveness:

> A questionnaire to a sample will work [but] I think that we've got to increase the amount of testing that we do, especially with the volume of people that seem to come into line groups... You've got to be able to competently say someone can do something ....and the value of that shows the sponsor that we're addressing the training that they need.

This perspective is also related to program provider views that they should "drive" evaluation planning and implementation to produce evidence of program effectiveness for their internal customers.

Dissemination of results.

All groups generally favored reporting program evaluation results to all stakeholders. Program sponsors all mentioned themselves as evaluation result recipients. As a whole this group indicated that evaluation results should be shared and made generally available:

> ...report the results to somebody who can actually take the action to do improvement, and two, we'd also want to report the results to the sponsors of the whole training program....The third audience would be the population at large. They need to know what has changed, what is new, and what is improved.

Another clear theme among this group was an aversion for large, especially paper, training program evaluation reports. Alternatives mentioned included web-based summaries and live presentation:

So typically web pages where information about courses is available....I think the last thing that [sponsors] need is a 10 page, closely type written report going into a lot of detail.

One senior line manager mentioned the use of a modified spreadsheet involving the display of training results using an integrated project "dashboard." This would allow managers to monitor several key project status variables at a glance:

There has been this business of dashboards and this division is working on its own. There are some very interesting concepts around the dashboard analogy where you don't have to have really complex indicators. It could be you have a needle basically that says this is the number you are at, and you have a green zone and a red zone, and if it is sort of in the red zone (and the red zone has been defined by what the organization would feel as uncomfortably low and heading for trouble) then it is just simply an indicator to ask the question, it's not meant to tell you necessarily [how to be] that much more effective, it's a sign of trouble and if you don't do something then maybe you are going to have a total breakdown. But very simple analogies like a car's dashboard with idiot lights almost, for example, "you're out of oil" type lights. Those kinds of concepts can be just the right jogs for the memory of the managers to look at it. And it's got to be sort of visible to them without them having to go and look for it, because they won't go. It's got to be as part of an overall organizational indicator. So part of the overall console would have a little corner of it that has training, and maybe training effectiveness would be a separate instrument, and it's not on the dashboard yet, because we haven't invented how we are going to measure yet, but

at least on the consumption indicators you could say, "it looks okay" or "it's not okay." And it can let the executives start asking questions. So it's sort of like, "what does it mean to me that I've got 9.3 days?" Is that good or is that bad? It's sort of like, what are you trying to present the information to me for? What is the purpose? So if the manager is looking at and he's got some sort of parameter range that says, "for my team this is the size of the eye of the needle." If it's in there, no problem, if you are outside of it we've got a problem. That's pretty much all they need, because they just want to make a quick view and say, "I'm okay" or "I'm not okay." "If I'm okay, I'm not going to take any further action." So that's sort of it at the highest level of abstraction.

Particularly coming from a senior line manager, these comments emphasize a view that sees training as one of many factors considered important to project success. Further information about the dashboard concept referred to by this manager are contained in **Appendix K**.

Trainees were more indifferent in their responses about the details of evaluation reporting. This group generally views all three stakeholder groups as legitimate recipients of evaluation results but sees program sponsors as primary users of evaluation. In stating that results should be reported "To the people who provide and will decide the future of the training program" one trainee implied a belief that trainees individually or collectively generally did not have much to do with deciding the future of the program. This group further favored use of the internal organizational intranet (web) for as a means to disseminate program evaluation results. Two individuals also mentioned their dislike for E-mail as a reporting method, while one individual suggested that, in spite of all

formalized reporting methods, training evaluation information flows among employees through informal interpersonal networks. This is particularly true of informal comments about courses as a way to share useful selection advice among coworkers.

Training providers superficially favored the widely shared dissemination of evaluation results as indicated by the comment of a training manager "I firmly believe that every person who contributed to the study should be given the opportunity to see the end results." But it was also clear that this group perceived themselves as the main owners of evaluation results and favored selective dissemination and control of reporting as indicated by the comments of two different training managers:

- [Program evaluation reporting] would depend on what you are reporting and what parts of the data you are reporting...it will probably have to be reported many different ways to different audiences and probably at different times.
- I am a service provider and my opinions are totally different when it comes to dealing with training from the person who is paying the money.

Corresponding to such views, this group did not support the use of a single, formal evaluation report document to be distributed to all stakeholders but instead suggested a range of tailored reporting means including the selective placement of information on an internal corporate web site, live presentation to sponsors as program funding decision makers, and E-mail formats.

As mentioned, stakeholder views of evaluation processes also correspond with and reflect each group's view of the purposes and consequences of evaluation. Emerging variation among the groups based on their respective views of training program results revolved largely around organizational results perceived as priorities for example,

customer satisfaction by each of the groups. These are further described in terms of evaluation consequences described next.

Consequences

Stakeholder views of evaluation consequences ranged from using evaluation results for rational program decision making to mostly political purposes. In the context of the framework used such consequences are described as instrumental, conceptual, and symbolic perceptions of utilization. Some evidence of process use was also found in terms of learning that occurred in study participants as a direct result of their participation in the study.

Program sponsors described largely instrumental and symbolic forms of utilization. Instrumental utilization patterns were described in terms of program success and improvement:

- The end result [of evaluation would be a] successful training program...everybody is able to learn the things they feel are important and as a result of that we do the right things.
- The consequence of it is that people would put some credibility into the training, that if I invest and send my employee to this training that he is going to be better for it, you need to build confidence up. Show that there is change there and adaptation, constant, continuous improvement taking place, monitoring yourselves, and trying to make things better. Just so you realize that the courses are not stagnant...it would lead to an improvement.

In addition to instrumental utilization for program improvement, the last comment additionally indicates a symbolic form of utilization based on the intent to use evaluation

to "build confidence up" and "show that there is a change". Symbolic utilization is illustrated by comments describing evaluation to demonstrate program credibility to groups and individuals both above and below in the line organization hierarchy. These include comments about showing senior and executive management that something is being done to evaluate and improve the program as well as using evaluation to demonstrate the benefits of engaging in program training to employees. One program sponsor commented:

> ...a consequence of the training program evaluation process would be that [executive management] would feel comfortable that something is in place that would raise a flag when necessary but not kind of put it in their face all the time when not necessary.

Such a comment underscores a clearly symbolic intention.

In addition to instrumental, conceptual, and symbolic forms of utilization, there was also some evidence of process use displayed by all three stakeholder groups. This was demonstrated by learning that resulted as a result of engaging in the study. For example, as became clear (from the written comments obtained on the phase 3 survey) most individuals in the case organization are generally not familiar with the field of evaluation. They are particularly not familiar with stakeholder-based evaluation. However, individuals in all three stakeholder groups indicated by their comments some learning specifically about stakeholder-based evaluation. For example, a program sponsor commented:

> I would expect some difference between the *stakeholders*, but not significantly. The training providers would want to get lots of data because that's

very close to what they do, that's where their *stakeholder* interest is.

In brief, individuals who probably had not deeply considered stakeholder-based evaluation approaches had begun to use its terminology simply by participating in the study.

Trainees were mostly concerned with using program evaluation for program improvement at the course level. As the group with the least accountability for program evaluation results, rather than discuss consequences in terms of symbolic utilization, this group described utilization in strongly instrumental and moderately conceptual terms.

- We will see an improvement in the quality of training being provided to designers and the quality of work coming out of the design groups. I'm focusing specifically on design because that's where I work, but I think that extends very well into other areas as well.
- Eventually I think that the training will be more suited to the needs of workers and to the needs of the [corporate division]. Because the existing courses will be evaluated and necessary actions will be taken, so this will satisfy the workers and the people who are taking the courses.

This group was most concerned with using evaluation to improve the program to better meet their perceived needs. In addition, various members of this group also exhibited an emerging awareness of stakeholder-based principles. The following trainee comment illustrates:

> So there is definitely the customer and supplier relationship happening in terms of how the different *stakeholders* would tend to evaluate or look upon the training organization.

Such a comment obviously demonstrates some increased awareness of stakeholder evaluation in this software designer.

Of the three stakeholder groups, program providers were by far the most opinionated describing program evaluation consequences in strongly instrumental and symbolic terms. Key instrumental consequences that were indicated involved improving the current program through slow, steady evolution and highlighting positive program results as "advertising" to assure and stimulate internal training business:

- If the evaluation is effective, we'll find that a curriculum evolves. So methods of media changes, the frequency of delivery changes, the modularity of training changes. So there is always some sort of movement. Things somewhat change [and are] not just constant.
- In a nutshell, the training will be hopefully revamped when I say revamped I don't mean a huge change, but even if it is a minor change and kept updated if it is done on a yearly basis.
- [Evaluation results should be used mainly] for recognition, for advertising. If we do a good job evaluating training then we can make the training better and better....So it will lead to changes in improvement to the course marketing you can get more people coming in.

As implied in the last comment, symbolic uses center around showing program value to internal customers. In addition to using evaluation instrumentally to improve the program training providers also continuously emphasize symbolic uses aimed at reinforcing their organizational importance through their affiliation with the program. Such results correspond well with, and to some degree explain, the mixed and varied

views of this group relative to the other two stakeholder groups. As professional instructional developers and managers of such functions, this group is obviously committed to improving their products and services based on formative modes of evaluation. However, as support staff outside the technical core, this group is also vulnerable to internal training program budget decisions, outsourcing, and large-scale organizational restructuring. Some implications of these results are discussed next in the context of the variation found across all stakeholders.

Implications

Table 8 summarizes stakeholder group views of training program results in relation to each group's view of training evaluation. In addressing the research questions this study has produced evidence to support that stakeholder views about training evaluation do at least partly depend on the organizational results they perceive for the program.

In relation to current research, the results of this research phase have helped to clarify previous findings. Phase 1 pattern matching correlations revealed substantive variation in the importance training providers ascribed to training program results as evaluation criteria particularly relative to the other two stakeholder groups. While aligning closely with these groups on the organizational results of training in terms of operational goals (e.g., as a major contributor to external customer satisfaction), training providers differentially increased their importance rankings of statements specifying what they labeled "effective training program attributes."

Table 8. Stakeholder Group Views of Training Program Evaluation in terms of Training Results

Stakeholder Group	Training Program Results Described	Training Program Evaluation Views
Sponsors	business performance customer and employee satisfaction product and employee development technology and market leverage	formative evaluation with sponsors and trainees as primary evaluation users; survey data and analysis with brief reporting to all stakeholders; instrumental evaluation utilization for program improvement; symbolic utilization to enhance perceived program credibility and promote employee participation
Trainees	professional development job performance design quality technical skill development	mixed (formative-summative) evaluation with sponsors and trainees as primary users; survey data and analysis with provider involvement and reporting to all stakeholders in web format; instrumental utilization for employee (trainee) course selection; conceptual utilization to educate providers for program improvement and support employee professional development
Providers	internal customer value (sponsors/trainees) employee satisfaction and productivity training program benefits and effectiveness skill and knowledge development	mixed and summative evaluation with sponsors and providers as primary users; survey and interview data and analysis with selective reporting to all stakeholders in brief format; instrumental utilization to sustain and expand program budget and funding; symbolic utilization to highlight program effectiveness and training specialist professional expertise

Statements ranked highest in this cluster described training program results that fell under the direct control and/or expertise of training specialists (e.g., selection of learning media; training needs assessment; teacher/mentor development; training-job learning integration). In contrast program sponsors and participants ranked the importance of statements much more consistently as both results and evaluation criteria for training.

In revisiting the partial variation result mentioned, in which stakeholder views were found to depend only partly on the results they perceived for the program, the question arises about other major sources of variation. The multiple-constituency and organizational power framework employed provides a useful heuristic. While each stakeholder group's view of program evaluation can be seen as somewhat dependent on the results the group perceives for the program, the overall program evaluation views of the training provider group are most remarkable. Specifically, in contrast to the other two (non-training) stakeholder groups, provider views of program evaluation are most consistent when this group is viewed as (1) the group with the most at stake with the program (in terms of their vulnerability relative to funding and budget cuts), and (2) the group external to the core function of the organization, in contrast to the two other two stakeholder groups.

From an organizational power perspective both non-training (line) groups operate within the central core of the internal coalition as described by Mintzberg (1983). As such these two groups are much more "organizationally-interdependent" in their needs to develop products and satisfy external customers. Internally these groups are interdependent in that line management must be sensitive to the attraction and satisfaction of the highly skilled knowledge workers composing the trainee population, while these

same knowledge workers have internal performance incentives (annual personal performance review tied to, e.g., rewards and compensation) related to project parameters of schedule and design quality.

Training program providers, on the other hand, are more driven by internal customer satisfaction, especially in terms of program sponsor satisfaction related to program sustaining in terms of funding and budgeting decisions. Concern with trainee satisfaction is important but secondary. Program providers are inclined to use training program evaluation instrumentally and symbolically to highlight their program's role in attaining organizational goals by sustaining and gradually evolving the program. As non-line support staff training providers demonstrate hybridized characteristics of what Mintzberg terms analysts of the technostructure and professional support staff:

> ...because of the nature of their professionalism, their work, their staff status, and their need for operational goals to prove the worth of their systems, the analysts...favor as goals, professional excellence, perpetual but moderate and well-regulated change in the organization....Compared with the analysts, the professional support staffers are not wedded to analysis per se, but rather to its application in some specialized branch of expertise. [Also] they work in small, fractionated groups offering rather vulnerable services to the organization (since these can usually be bought externally), it is in their interest not to pressure for autonomy but rather the reverse--to encourage their involvement in decision processes. (pp. 137-138)

Viewed this way, training providers favor aspects of evaluation that are instrumental in emphasizing training's—and hence their own—contribution to the operational goals of line management.

The influence of power and politics in both general organizational life and specifically in program evaluation have been noted. In stating that the power of organizational actors is fundamentally determined by (1) the importance of what they do in the organization, and (2) their skill in doing it, Pfeffer (1981) asserts that power differences are both structurally determined and inevitable in large organizations. According to Weiss (1987, p. 49) "The politics of program survival is an ancient and important art." While originally presenting her ideas 25 years ago in reference to large, federally-funded social programs, this study has produced evidence to substantiate a similar conception of large, privately-funded, training programs.

Phase 2 Limitations

Three main study limitations are described. A positive aspect of all three limitations, however, is that each represents an opportunity for further research and is recognized as such. First, as a single organization case study, the generalizability of the results is necessarily limited. Repetition of the approach and methodology in similar organizations would add strength to any "petite generalizations" (Stake, 1995, p. 7) begun here. Second, while the literature supporting the elements of the conceptual framework employed is fairly well developed, there is a clear dearth of specific empirical work on stakeholder-based training program evaluation referencing this framework. Beyond the scarce empirically-based work cited earlier (Brown, 1994) there is little in the current literature to allow a comparison of results. Third, because two of the three

stakeholder groups studied namely training sponsors (as line management) and training participants (as non-management employees) constitute relatively large populations in the case organization and because they exhibited relatively consistent but not identical views, further quantitative investigation could lead to a more complete understanding of stakeholder variation between these two particular stakeholder groups. Perceptual comparison among program sponsors and trainees could be accomplished, for example, through quantitative survey methods. This type of further investigation would also help to triangulate and generalize the findings.

Phase 2 Summary

In view of the second question posed, the interview research performed in phase 2 produced evidence that stakeholder group views about training program evaluation do depend in part on the organizational results these groups perceive for the program. Interviewing and qualitative analysis was used to study group perceptions of the purposes, process, and consequences of evaluation in term of the training program results perceived by these groups. A total of 15 members from three organizational stakeholder groups, including training program (1) providers, (2) sponsors, and (3) participants/trainees, were interviewed. While all stakeholder groups commonly identified several categories of organizational training program results, for example, customer and employee satisfaction, each group placed a varying emphasis on these as training program results. This varied emphasis was shown to influence group views of training program evaluation.

Stakeholder group views of training program evaluation were also found to be related to each group's role in relation to the program. This effect was found to be most

pronounced in the training provider stakeholder group. As the stakeholder group with the most immediate stake in the program, training provider views of training evaluation were found to most influenced in their organization role as support staff. Providers perceived training evaluation more in terms of internal client satisfaction to demonstrate program value as a means to sustain and grow the program based on sponsor funding decisions. In contrast, a closer and organizationally more interdependent relationship was suggested between sponsors and trainees. Their relatively similar views of training program results were more consistent with their views of the purposes, processes, and consequences of evaluation, however, some variation was also found in the emphasis each of these group placed on evaluation. Program sponsors exhibited keen interest in training program evaluation in terms of business and customer satisfaction. Program participants recognized these but further emphasized their own professional career development. These perceptual variations were explored further using the survey techniques and quantitative methods discussed in the next chapter.

Chapter 6

Phase 3: Quantitative Survey Results

This chapter describes the survey results obtained. The purpose of the survey was to further address research question two regarding stakeholder views of training evaluation in relation to their perceptions of training results. The survey involved managers (sponsors) and non-managers (trainees) in the case organization. As discussed in Chapter 3, the local population of training providers was too small (relative to the size of the other groups) to include in the survey.

As described in detail below, the central analyses performed here were concerned with the relationship between three predictor variables developed to describe stakeholder perceptions of training results and five criterion variables developed to describe stakeholder perceptions of training evaluation. The three predictor variables developed described training results in terms of customer satisfaction, product development, and employee satisfaction. The five criterion variables derived described training evaluation in terms of evaluation purposes, data collection, participation and involvement, instrumental-conceptual use, and symbolic evaluation use.

Beyond several marginal differences revealed between the groups regarding their respective perceptions of training results and training evaluation, the key concern relative to research question two is which (if any) of the predictor variables (training results) are related to the criterion variables describing stakeholder perceptions of training evaluation. The following sections provide a progressive description of the analyses performed beginning with item-level results.

Item-Level Results

Part 1 of the survey included 20 items pertaining to stakeholder perceptions of training results. As mentioned, these items were developed based on findings in the previous two studies with reference to the conceptual framework developed. The item-level results by stakeholder group for each of the 20 part 1 items are first examined followed by a similar examination of the items in survey part 2.

Part 1: Training results

As mentioned above, all items were scored using a five-point scale: 1=strongly disagree, 2=disagree, 3=neither agree or disagree, 4=agree, 5=strongly agree. **Table 9** displays each of the items from survey part 1 along with group comparisons of item means, standard deviations, and numbers of respondents in both stakeholder groups. As shown, missing data problems were minimal with most items answered by all of the managers (n=60) and non-managers (n=220) who returned surveys.

Item means (M) ranged from 2.03 (managers—Only job-specific training should be provided to employees) to 4.40 (managers—The availability of high-quality training leads to increased employee satisfaction). Item standard deviations ranged from .61 (non-managers—The availability of high-quality training leads to increased employee satisfaction) to 1.04 (managers—The main purpose of training should be to improve customer satisfaction).

Item-level group means were also compared using independent samples t-tests. The null hypothesis is that there is no difference between average ratings by managers and non-managers.

Table 9. Item-Level Results by Stakeholder Group for Survey Part I

Survey Items: Training Program Results	Stakeholder Group	n	M	SD
• An effective training program attracts or retains the most talented employees.	manager	59	3.34	.94
	non-manager	220	3.53	.98
• Effective training ultimately improves business profitability.	manager	60	4.35	.66
	non-manager	219	4.37	.66
• The main purpose of training should be to improve customer satisfaction	manager	60	2.90	1.04
	non-manager	220	2.95	1.00
• Effective training should directly support our customer's business objectives	manager	60	3.43	.85
	non-manager	220	3.41	.86
• Effective training should help designers to anticipate customer requirements	manager	60	3.33*	.97
	non-manager	220	3.65*	.89
• Effective training should improve employee understanding of product development processes	manager	60	4.03	.64
	non-manager	219	3.90	.67
• Effective training ultimately improves employee-customer relations	manager	60	3.62	.87
	non-manager	220	3.43	.81
• The main purpose of training should be to improve employee productivity	manager	60	3.83	1.01
	non-manager	219	3.98	.94
• The availability of high-quality training leads to increased employee satisfaction.	manager	60	4.40	.74
	non-manager	220	4.39	.61
• Effective training ultimately leads to product innovation	manager	60	3.22**	1.01
	non-manager	219	3.67**	.90
• Only job-specific training should be provided to employees	manager	60	2.03	.92
	non-manager	220	2.08	.95
• Effective training should result in the immediate use of knowledge on the job	manager	59	3.36	.94
	non-manager	220	3.31	1.02
• Training is the best way to make new employees productive as quickly as possible	manager	60	3.85	.88
	non-manager	220	3.90	.94
• Employee pay and employee training are directly related	manager	60	2.22	.92
	non-manager	220	2.43	.83
• The main purpose of training should be to develop employees professionally	manager	60	3.77**	.91
	non-manager	219	4.16**	.71
• Employee promotion and employee training are directly related	manager	59	2.54	.95
	non-manager	220	2.70	.98
• Product quality can be improved substantially through employee training	manager	60	4.32	.68
	non-manager	218	4.19	.86
• All training provided to employees should have a positive "Return on Investment" (ROI)	manager	60	3.45	1.00
	non-manager	219	3.50	.95
• Training program objectives should be derived directly from organizational business objectives	manager	59	3.36	.98
	non-manager	219	3.14	.95
• Product Time to Market (TTM) can be reduced substantially through employee training	manager	60	3.48	.98
	non-manager	219	3.58	.84

Note: group mean comparison using independent samples t-test (alpha = .05)
* $p \leq .05$** $p \leq .001$

The alternative is that there is a difference. By selecting an alpha level of significance of .05 as the probability of committing a Type I error (rejecting the null hypothesis when it is true) significant differences ($p \leq .05$) between managers and non-managers were found in only three of the 20 items. In all three cases non-managers agreed more strongly than managers with the statements which had to do with training results respectively in terms of anticipating customer requirements, product innovation, and employee professional development. For the item "Effective training should help designers to anticipate customer requirements" the average ratings by non-managers (M=3.65) was significantly greater (p = .017) than those of managers (M=3.33). Non-managers also rated the item "Effective training ultimately leads to product innovation" significantly higher (M=3.67; p = .001) than managers (M=3.22). Similarly, for the item "The main purpose of training should be to develop employees professionally" the average rating by non-managers (M=4.16) was significantly greater ($p < .001$) than that of managers (M=3.77).

Part 2: Training Program Evaluation

The same five-point scale used for part 1 was also used to score items in part 2. **Table 10** displays each of the items from survey part 2 along with the item mean, standard deviation, and number of respondents by stakeholder group. While missing data was similarly not excessive, the number of individuals who rated all items in part 2 was obviously less than that of the previous section on training results. Generalizations can be made as to the possible reasons for this (e.g., respondent fatigue), however, the written comments (discussed later) indicate that a substantial number of respondents considered the items in this section as somewhat technical and beyond their specialty area or realm of expertise.

Table 10. Item-Level Results by Stakeholder Group for Survey Part II

Survey Items: Training Program Evaluation	Stakeholder Group	n	M	SD
• The main purpose of training program evaluation is to improve the program	manager	57	4.07	.62
	non-manager	216	4.08	.62
• The main purpose of training program evaluation is to judge whether the program should be continued	manager	56	3.80	.67
	non-manager	216	3.94	.69
• Training specialists should be actively involved in performing the training program evaluation	manager	58	3.72	.79
	non-manager	217	3.88	.69
• Trainees (training recipients) should be actively involved in performing the training program evaluation	manager	58	4.14	.54
	non-manager	217	4.04	.69
• Training sponsors (line management) should be actively involved in performing the training program evaluation	manager	58	3.74	.81
	non-manager	217	3.69	.75
• External evaluation experts should be actively involved in performing the training program evaluation	manager	58	3.28	.99
	non-manager	216	3.40	.89
• Questionnaire data from training participants is essential in training program evaluation	manager	59	3.63	.79
	non-manager	216	3.74	.76
• Interview data from training participants is essential in training program evaluation	manager	59	3.61	.70
	non-manager	216	3.40	.82
• Focus group data from training participants is essential in training program evaluation	manager	59	3.44	.73
	non-manager	216	3.40	.78
• Knowledge test data from training participants is essential in training program evaluation	manager	59	3.47	.97
	non-manager	216	3.33	.88
• All training program evaluation results should be reported directly to training specialists	manager	59	4.05	.63
	non-manager	217	3.93	.65
• All training program evaluation results should be reported directly to trainees (training recipients)	manager	59	3.61	.89
	non-manager	217	3.63	.77
• All training program evaluation results should be reported directly to training sponsors (line management)	manager	59	4.03	.76
	non-manager	217	3.83	.76
• Training program evaluation results should be used mainly as a basis for future decisions about the program	manager	56	3.89	.73
	non-manager	215	3.98	.67
• Training program evaluation results should be used mainly to develop new knowledge about program effects	manager	55	3.82	.47
	non-manager	213	3.77	.71
• Training program evaluation results should be used mainly to comply with quality standards such as ISO audits	manager	57	2.14**	.93
	non-manager	215	2.84**	.86
• Training program evaluation results should be used mainly to routinely monitor program activities	manager	57	3.25	.83
	non-manager	215	3.36	.85
• Training program evaluation results should be used mainly to determine trainee satisfaction with the program	manager	57	3.82	.85
	non-manager	215	3.87	.74
• Training program evaluation results should be used mainly to determine manager satisfaction with the program	manager	57	3.25	.97
	non-manager	214	3.24	.81
• Training program evaluation results should be used mainly to determine if the program is meeting its goals	manager	58	4.10*	.58
	non-manager	215	3.90*	.72
• Training program evaluation results should be used mainly to assist trainees in selecting courses	manager	58	3.09	.88
	non-manager	213	3.34	.92

Note: group mean comparison using independent samples t-test (alpha = .05)
* $p \leq .05$** $p \leq .001$

Nevertheless, each item in part 2 was rated by a minimum of 55 managers and 213 non-managers, with most items being rated respectively by at least 57 and 215 individuals. Item means ranged from 2.14 (managers—Training program evaluation results should be used mainly to comply with quality standards such as ISO audits) to 4.14 (managers—Trainees should be actively involved in performing the training program evaluation). Item standard deviations ranged from .47 (managers Training program evaluation results should be used mainly to develop new knowledge about program effects) to .99 (managers—External evaluation experts should be actively involved in performing the training program evaluation).

Item-level group means were also compared using independent samples t-tests. Significant differences ($p \leq .05$) between managers and non-managers were found in only two items. Managers agreed (M=4.10) more strongly than non-managers (M=3.90) that "Training program evaluation results should be used mainly to determine if the program is meeting its goals" ($p = .047$). However, non-managers provided a higher rating (M=2.84; $p < .001$) to the statement "Training program evaluation results should be used mainly to comply with quality standards such as ISO audits" than managers (M=2.14) who more clearly tended to disagree with the statement.

Scale Variable Construction and Description

Several multiple-item scale variables were also constructed as linear combinations of item average scores. In addressing the second research question about whether stakeholder views of training program evaluation depend on the results they perceive for the program, all items from both part 1 and part 2 were initially grouped respectively in terms of specific subcategories of training results and evaluation purposes, processes, and

consequences. This process ultimately resulted in the definition of three predictor variables for training results and five criterion variables for training evaluation. The details of predictor and criterion variable construction are described next.

Training Program Result Predictor Variables

Referencing the phase 1 results as discussed in Chapter 3, all items in part 1 of the survey were organized conceptually into subcategories of training results. As shown in **Table 11** the items were grouped initially according to the following six conceptual subcategories of training results: (1) business and market, (2) customer satisfaction, (3) product development, (4) employee productivity, (5) training efficiency, and (6) employee satisfaction. While each of these initially contained a minimum of three items to allow for the calculation of reliability coefficients (Cronbach's alpha) unacceptably low reliability coefficients were revealed using these sub-categories. The coefficients for each of the categories were as follows: business and market (α =.53), customer satisfaction (α =.59), product development (α =.46), employee productivity (α =.40), training efficiency (α =.48), and employee satisfaction (α =.61).

Although Hinkin (1998) stated that a coefficient alpha value of .70 is considered large for exploratory measures, the original reliability coefficients were considered too low. To improve this situation the results from the previous two study phases and conceptual framework were used to regroup items from part 1 into three conceptually broader subcategories describing training results in terms of (1) customer satisfaction, (2) product development, and (3) employee satisfaction. As shown in **Table 12** this regrouping did substantially improve reliability among the variables and so these were developed and used for subsequent analysis.

Table 11. Part I item groupings as anticipated scale variables (20 total; 3 to five items per variable)

Business & Market	Customer Satisfaction	Product Development	Employee Productivity	Training Efficiency	Employee Satisfaction
-Effective training ultimately improves business profitability -Training program objectives should be derived directly from organizational business objectives -Effective training should directly support our customer's business objectives	-The main purpose of training should be to improve [organization] customer satisfaction -Effective training should help designers to anticipate customer requirements -Effective training ultimately improves employee-customer relations	-Product quality can be improved substantially through employee training -Effective training should improve employee understanding of product development processes -Effective training ultimately leads to product innovation	-The main purpose of training should be to improve employee productivity -Product Time to Market (TTM) can be reduced substantially through employee training -Training is the best way to make new employees productive as quickly as possible	-Only job-specific training should be provided to employees -All training provided to employees should have a positive "Return on Investment" (ROI) -Effective training should result in the immediate use of knowledge on the job	-The availability of high-quality training leads to increased employee satisfaction -The main purpose of training should be to develop employees professionally -Employee promotion and employee training are directly related - Employee pay and employee training are directly related -An effective training program helps to attract and/or retain the most talented employees

Table 12. New Predictors—Training Program Results (15 out of 20 original items used)

Predictor Variable	Description (Composite Items)	α	Mean*	SD	N
Customer Satisfaction	Composite (average) of 4 items associated with external customer satisfaction (from survey part I): (1.6) The main purpose of training should be to improve customer satisfaction (1.9) Effective training should help designers to anticipate customer requirements (1.14) Effective training should directly support our customer's business objectives (1.15) Effective training ultimately improves employee-customer relations	.67	3.35	.282	280
Product Development	Composite (average) of 6 items associated with product development and productivity (part I): The main purpose of training should be to improve employee productivity (1.3) Product quality can be improved substantially through employee training (1.10) Product Time to Market (TTM) can be reduced substantially through employee training (1.12) Effective training should improve employee understanding of product development processes (1.16) Training is the best way to make new employees productive as quickly as possible (1.18) Effective training ultimately leads to product innovation	.60	3.85	.252	277
Employee Satisfaction	Composite (average) of 5 items associated with employee satisfaction (part I): (1.3) The availability of high-quality training leads to increased employee satisfaction (1.8) The main purpose of training should be to develop employees professionally (1.13) Employee promotion and employee training are directly related (1.17) Employee pay and employee training are directly related (1.20) An effective training program helps to attract and/or retain the most talented employees	.61	3.40	.873	277

*The same 5-point scale was used for all items: 1=strongly disagree, 2=disagree, 3=neither agree nor disagree, 4=agree, 5=strongly agree

It should be noted that, in an effort to obtain better scale variable reliability, a departure was taken from the conceptual framework and an exploratory factor analysis (principle components with varimax rotation; factor extraction using Eigenvalues > 1; factor loadings $\geq$ .40) was also performed on all part 1 items. This yielded five factors which accounted for 52% of the variance. However, because only one factor (factor 1) yielded a potential scale variable with a reliability in excess of .7, and because the remaining potential scale variables (defined by the remaining factors) were conceptually unrelated to each other, the use of factor analysis to construct scale variables was abandoned in favor of the conceptual framework and previous results described. **Appendix L** contains the detailed results of this factor analysis.

Training Program Evaluation Criterion Variables

Referencing the conceptual framework and phase 2 research as described in Chapter 3, a set of predictor variables related to training evaluation was also developed from the part 2 survey items. Similar to the process used to derive the part 1 scale variables, the criterion variables were also organized into subcategories describing stakeholder perceptions of the purposes, processes (data collection, participation and involvement) and consequences of training evaluation. **Table 13** shows the initial item groupings by subcategory. As shown training evaluation purposes are described in terms of formative and summative categorizations. Evaluation processes are divided into three subcategories related to (1) stakeholder involvement in the performance of the evaluation, (2) data collection, and (3) reporting audience.

Table 13. Part II items: 25 total (includes OTHER write-in items)

Purposes	Processes	Consequences
-The main purpose of training program evaluation is to improve the program -The main purpose of training program evaluation is to judge whether the program should be continued -OTHER [write in]	Involvement -Training specialists should be actively involved in performing the training program evaluation -Trainees (training recipients) should be actively involved in performing the training program evaluation -Training sponsors (line management) should be actively involved in performing the training program evaluation -External evaluation experts should be actively involved in performing the training program evaluation -OTHER [write in] Data -Questionnaire data from training participants is essential in training program evaluation -Interview data from training participants is essential in training program evaluation -Focus group data from training participants is essential in training program evaluation -Knowledge test data from training participants is essential in training program evaluation -OTHER [write in] Reporting -All training program evaluation results should be reported directly to training specialists -All training program evaluation results should be reported directly to trainees (training recipients) -All training program evaluation results should be reported directly to training sponsors (line management) -OTHER [write in]	-Training program evaluation results should be used mainly as a basis for future decisions about the program -Training program evaluation results should be used mainly to develop new knowledge about program effects -Training program evaluation results should be used mainly to comply with quality standards such as ISO audits -Training program evaluation results should be used mainly to routinely monitor program activities -Training program evaluation results should be used mainly to determine trainee satisfaction with the program -Training program evaluation results should be used mainly to determine manager satisfaction with the program -Training program evaluation results should be used mainly to determine if the program is meeting its goals -Training program evaluation results should be used mainly to assist trainees in selecting courses -OTHER [write in]

Additionally, eight items were included to describe various instrumental, conceptual, and symbolic consequences of evaluation. The reliability coefficients initially obtained for each item subcategory were as follows: purposes (α =.65), processes involvement (α =.59), data (α =.66), reporting (α =.56); consequences (all items combined, α =.75). Again, adhering to the original conceptual framework, these groupings were adjusted in terms of the previous results obtained to improve reliabilities and construct the criterion variables shown in **Table 14**.

As shown, the criterion variables developed to describe training evaluation include (1) evaluation purposes, (2) data collection, (3) participation and involvement, (4) instrumental-conceptual use, (5) symbolic use. The reliabilities for these variables fall in the range of .65 to .69. Similar to the process used to analyze the part 1 items, a factor analysis (principle components with varimax rotation; factor extraction using Eigenvalues > 1; factor loadings $\geq$ .50) was also performed for the part 2 survey items. Of the seven factors extracted reliability coefficients ranged between .61 and .42 Because of these low reliabilities and because the items composing the factors were conceptually unrelated, factor analysis was again abandoned (in favor of the conceptual groupings described). The factor analysis details for the part 2 items are also displayed in **Appendix L**. The next section describes the zero-order intercorrelation relationships revealed among the scale variables derived.

Table 14. New Criterion Variables—Training Program Evaluation (all 21 survey items used)

Criterion Variable	Description (Composite Items)	α	Mean*	SD	N
Evaluation Purposes	Composite (average) of 2 items associated with evaluation purposes (from survey part II): (2.1) The main purpose of TPE is to improve the program (2.2) The main purpose of TPE is to judge whether the program should be continued	.65	3.99	.117	272
Data Collection (Process)	Composite (average) of 4 items associated with data collection process (part II): (2.9) Questionnaire data from training participants is essential in TPE (2.10) Focus group data from training participants is essential in TPE (2.11) Interview data from training participants is essential in TPE (2.12) Knowledge test data from training participants is essential in TPE	.66	3.48	.159	275
Participation and Reporting (Process)	Composite (average) of 7 items associated with participation and reporting process (part II): (2.4) Training specialists should be actively involved in performing the TPE (2.5) Trainees (training recipients) should be actively involved in performing the TPE (2.6) Training sponsors (line management) should be actively involved in performing the TPE (2.7) External evaluation experts should be actively involved in performing the TPE (2.14) TPE results should be reported directly to training specialists (2.15) TPE results should be reported directly to trainees (training recipients) (2.16) TPE results should be reported directly to training sponsors (line management)	.67	3.77	.228	274
Instrumental-Conceptual Use (Consequences)	Composite (average) of 6 items associated with instrumental-conceptual use (part II): (2.18) TPE results should be used mainly as a basis for future decisions about the program (2.24) TPE results should be used mainly to determine if the program is meeting its goals (2.25) TPE results should be used mainly to assist trainees in selecting courses (2.20) TPE results should be used mainly to comply with quality standards such as ISO audits (2.19) TPE results should be used mainly to develop new knowledge about program effects (2.21) TPE results should be used mainly to routinely monitor program activities	.65	3.51	.485	266
Symbolic Use (Consequences)	Composite (average) of 2 items associated with symbolic (part II): (2.22) TPE results should be used mainly to determine trainee satisfaction with the program (2.23) TPE results should be used mainly to determine manager satisfaction with the program	.69	3.55	.436	271

*The same 5-point scale was used for all items: 1=strongly disagree, 2=disagree, 3=neither agree nor disagree, 4=agree, 5=strongly agree

Relationships Among Scale Variables

Table 15 shows the zero-order intercorrelations among the scale variables constructed to describe stakeholder views of training results and evaluation. This table shows the five criterion variables (variables one through five) presented first followed by the three predictors (variables six through eight). Significant ($p \leq .05$) to highly significant ($p \leq .001$) relationships were observed among all values. As shown by the cell values in the first five intersecting rows and columns, intercorrelations among the five criterion (dependent) variables are all positive ranging from .18 to .58. All positive intercorrelations, ranging from .44 to .57, were again observed among the predictor variables (rows and columns six through eight). The moderate size of most coefficients suggests that the scale variables are measuring different constructs. Also, because these values are moderate, assumptions regarding multicollinearity[16] are not likely to have been violated. Additionally, as shown by the cell values in the intersections of columns one through five with rows six through eight, all intercorrelations between the predictor and criterion variables are positive (ranging from .15 to .29). These values suggest a positive relationship between group perceptions about training results (predictor) and those related to training evaluation (criterion variables).

[16] Multicollinearity is related to tolerance in describing the proportion of an independent variable's variability that is not explained by its linear relationships with the other independent variables in the model. As a proportion ranging from 0 to 1, a tolerance close to 1 indicates that an independent variable has little of it variability explained by the other independent variables. A value close to 0 signals possible multicollinearity problems by indicating that a variable is almost a linear combination of the other independent variables (Norusis, 1997).

Table 15. Zero-order Intercorrelations among criterion and predictor (scale) variables (Pairwise deletion of missing data, N= 270 to 280)

Variable[a]	1	2	3	4	5	6	7	8
1. Evaluation Purposes	--							
2. Data Collection	.29***	--						
3. Participation and Involvement	.35***	.46***	--					
4. Instrumental-Conceptual Use	.36***	.33***	.41***	--				
5. Symbolic Use	.18**	.27***	.37***	.58***	--			
6. Customer Satisfaction	.17**	.17**	.26***	.25***	.24***	--		
7. Product Development	.16**	.19**	.24***	.17**	.15*	.57***	--	
8. Employee Satisfaction	.18**	.21***	.32***	.29***	.23***	.44***	.48***	--

[a] Scale variables 1 through 5 are dependent (criterion) variables; 6 through 8 are independent (predictor) variables.
*$p \leq .05$ **$p \leq .01$ ***$p \leq .001$

Analysis of Group Differences

A MANOVA[17] procedure was performed to test for differences between groups regarding views of training results using the three predictor variables constructed. A marginal difference between the groups was revealed ($p = .055$) by Hotelling's multivariate F (2.563; $df = 3; 276$). While this multivariate result was marginal, as shown in **Table 16** separate univariate tests revealed that the only significant effect was associated with the variable "employee satisfaction" ($F = 7.05$, $p = .008$).

Table 16. Predictor Variable Univariate Tests

Variable	SS	df	MS	F	p
Customer Satisfaction	1.31	1	1.31	.20	.655
	1816.63	278	6.54		
Employee Satisfaction	49.46	1	49.46	7.05	.008
	1950.32	278	7.02		
Product Development	6.66	1	6.66	.67	.415
	2781.12	278	10.00		

The F tests the effect of manager based on the linearly independent pairwise comparisons among the estimated marginal means.

Item-level t-tests on the five statements composing this variable revealed a significant difference ($p \leq .001$) for only a single statement (1.8) on employee professional development. Based on the five-point scale used (1 = strongly disagree through 5 = strongly agree) non-managers agreed more strongly ($M = 4.16$) than managers ($M = 3.77$) with the statement: "The main purpose of training should be to develop employees professionally."

[17] According to SPSS, Inc. (1997) both MANOVA and GLM provide generalized procedures for analysis of variance and covariance. The major distinction is that GLM uses a non-full-rank or overparameterized indicator variable approach in linear models instead of the full-rank reparameterization approach used in MANOVA. For the current analysis both procedures yielded identical results.

Of the remaining two predictor variables, "customer satisfaction" and "product development" each contained one statistically significant item based on the item-level t-tests discussed. Non-managers agreed more strongly (M = 3.65) than managers (M = 3.33) with the statement "Effective training should help designers to anticipate customer requirements" in the customer satisfaction variable. Non-managers also agreed more strongly (M =3.67) than managers (M =3.22) with the statement "Effective training ultimately leads to product innovation" in the product development variable.

The MANOVA procedure was also used to examine differences between groups regarding views of training evaluation using the five criterion variables constructed. Somewhat greater difference between groups was revealed (p = .022) by Hotelling's multivariate F (2.691; df = 5; 264). As shown in **Table 17** separate univariate tests revealed only the variable describing "Instrumental-Conceptual Use " to be significant (F = 5.83, p = .016).

Table 17. Criterion Variable Univariate Tests

Variable	SS	df	MS	F	p
Evaluation Purposes	1.97	1	1.97	1.51	.221
	349.80	268	1.31		
Data Collection	7.84	1	7.84	1.55	.215
	1359.92	268	5.07		
Participation and Involvement	2.38	1	2.38	.26	.614
	2502.67	268	9.34		
Instrumental-Conceptual Use	52.33	1	52.33	5.83	.016
	2406.77	268	8.980		
Symbolic Use	5.77E-02	1	5.768E-02	.029	.865
	530.24	268	1.98		

The F tests the effect of manager based on the linearly independent pairwise comparisons among the estimated marginal means.

Significant differences were found at the item-level in two of the six items composing this variable. As discussed in the item-level analysis, both statements that showed significant differences between managers and non-managers were found in this scale

variable. In the first of these, managers agreed more strongly (M = 4.10) than non-managers (M = 3.90) with the statement "Training program evaluation results should be used mainly to determine if the program is meeting its goals." However, non-managers agreed much more strongly (M = 2.84) than managers (M = 2.14) with the statement " Training program evaluation results should be used mainly to comply with quality standards such as ISO audits." As described later in this chapter, several of the written comments also support these differences. For example, these comments suggest that managers tend to perceive training results more in terms of the extent to which they help to achieve certain management objectives, hence, they favor instrumental-conceptual modes of evaluation utilization that support this view.

Perceptions of evaluation in terms of training results.

Stepwise multiple regression was also used to further explore the relationship between stakeholder views of training results and evaluation. As shown in **Table 18** the five criterion variables were regressed on the three predictors in separate models. As indicated by the values for R^2 , a relatively low amount of variability was explained by each of the models. However, several significant relationships were revealed between stakeholder views of training results in terms of both employee and customer satisfaction. As shown, the predictor labeled "employee satisfaction" was retained and most significant in all models constructed. This outcome suggests that stakeholder group perceptions of evaluation are influenced by their perceptions of training results particularly in terms of employee satisfaction (see research question two) .

Table 18. Stepwise Multiple Regression of Training Program Evaluation on Training Program Results

Criterion	R^2	df[a]	F	Predictor Variables Remaining in Model	t
Evaluation Purposes	.034	1, 271	9.52**	Employee Satisfaction	3.09**
Data Collection	.042	1, 273	11.96***	Employee Satisfaction	3.46***
Participation and Involvement	.118	2, 273	18.19***	Employee Satisfaction	4.03***
				Customer Satisfaction	2.23*
Instrumental-Conceptual Use	.102	2, 271	15.41***	Employee Satisfaction	3.53***
				Customer Satisfaction	2.27*
Symbolic Use	.076	2, 269	11.09***	Customer Satisfaction	2.57*
				Employee Satisfaction	2.39*

[a] regression; residual degrees of freedom
*$p \leq .05$; **$p \leq .01$; ***$p \leq .001$

Summary and Limitations of Quantitative Results

Perhaps not surprisingly in view of the results obtained in the previous two studies, only moderate variation was found among the training client group stakeholders. The variation that was found, however, supports the general predictions made regarding manager and non-manager emphasis in terms of both the results and evaluation of training. While both groups related training results closely with overall employee satisfaction, significant differences found in both the univariate and multivariate tests suggest that employees perceived training results more in terms of their own professional development than did their line manager counterparts. Both groups of training evaluation were shown to be related to their views of training results marginally in terms of employee and customer satisfaction.

Before attempting to generalize these results further, however, several limitations should be recognized. First, the relatively low reliability exhibited among the scale variables is considered a notable limitation. In performing these analyses it was found that various other item combinations (e.g., using factor analysis) could indeed produce scale variables with higher reliability coefficients. However, as described such combinations tended to deviate profoundly from the conceptual framework and research questions thereby producing "variables" that largely defied interpretation. For example, grouping the part 1 items related to "pay" and "promotion" does indeed yield a high coefficient alpha (.78), however, this is the case simply because there is no significant difference between managers and non-managers in their mild disagreement that training is directly related to these. Simply stated, neither group indicated a belief that there is

some direct proportionality between training and one's pay or promotion status in the organization.

The second limitation to note is the relatively low $\underline{R}^2$ coefficients obtained in the regression analysis. The ability for the models defined to describe more variation could well be related to the relatively low reliabilities for the scale variables. Hence, while the results obtained suggest that stakeholder group perceptions of training program evaluation may be moderately dependent on the training results they perceive in terms of employee satisfaction, further investigation could only improve our understanding of this apparent relationship.

A third limitation is that these results were obtained within a single organization. Any generalizations to be made from the results would have to be based on a broader deployment of the survey instrument in a range of representative organizational settings. Lastly, and perhaps most obvious, this phase of research was limited to only two of the three stakeholder groups identified. As explained, the training provider group did not have a population sufficient to survey and compare relative to the size of the other two groups.

Even given these limitations, however, the results obtained might be best viewed as a useful beginning for continuing exploration beyond the scope of the present research. Also, in addition to these quantitative results, a good number of written comments were also supplied. These were useful to more thoroughly understand the quantitative results. They are discussed next.

Written Comments

In addition to responding to the quantitative survey items, respondents also provided a higher than anticipated volume of written comments. These comments have been transcribed from the surveys and are included in **Appendix M**. The written comments were especially useful in assisting in the overall interpretation and meaningfulness of the survey data. Using a similar coding analysis approach as described for the previous qualitative phase of the research, these comments were content analyzed. This section presents the results of these analyses.

Training results

Comments were extracted from the completed surveys and transcribed for coding and analysis. Because the comments were provided by respondents in the context of a particular survey section (and were therefore bounded by the questions being asked) two broad coding categories were defined to correspond respectively with the first two sections of the survey on training results and training program evaluation. Several start codes were defined to correspond with the research questions and conceptual categories initially established for the analysis of the quantitative results (see Tables 11 and 13 respectively). In addition, several codes were added during analysis to accommodate other comments not related to the start codes defined. Both the start and add-on codes are shown in **Appendix N**. While both managers and non-managers commented similarly in many areas, several differences also emerged from the analysis.

Both managers and non-managers commented about training results in common terms of employee and customer satisfaction, product development, and business results.

Examples of typical comments about training results made by managers included the following:

- A happy, productive, effective employee producing a high-quality effective product. Poor, ineffective, training is more a dissatisfier than good training is a satisfier; continuous employee development; development of skills needed for future growth of [the company]
- Happy and productive employees that are knowledgeable in both technical skills, process skills best practices, and people skills
- Improved effectiveness; improved ESAT [employee satisfaction] and CSAT [customer satisfaction]

Non-managers provided similar comments related to employee and customer satisfaction:

- Increased awareness of products, processes; CSAT as well as ESAT
- Improve employee satisfaction
- A satisfied employee
- Effectively trained and satisfied participants

Both groups also recognized training's role in keeping up with technological, and industry-specific change. Related to this managers commented that training should result in

- increased productivity, quick familiarity with product and work environment; allow designers to stay current with leading-edge technology advances and practices
- a program which can adopt quickly to changing needs

Perhaps because they are most directly affected by job-specific knowledge requirements, non-managers cited training results mostly in relation to their own jobs in relation to product development. In their view effective training results in

- employees knowledgeable in their field; continuing training is necessary to stay on the cutting edge [it] makes employees productive as fast as possible; improves employee-customer relations; leads to product innovations
- [broadening] employee knowledge as well as to enhance their effectiveness
- [a] continuously update [of] employees knowledge (since the technology is evolving so fast)
- employees who are effective in their current positions and up-to-date with the changing world. [Also serves as] a method for employees to improve professionally and improve their knowledge
- employees that can adapt to a rapidly changing business environment; employees that are willing/capable of anticipating future customer requirements
- [developing employee awareness of] technological domain trends
- [developing employee awareness of] market trends, new technology

Such comments about "keeping up" also extended into those specifically about helping newly-hired employees learn sufficiently fast to become effective on the job. The following manager comment is illustrative:

> [The training program should produce] new hires effectively trained and confident to act independently more often; reducing other staff's time in providing assistance; increasing quality of their output sooner; connecting them to their environment faster

However, beyond these comments, non-managers tended to describe training results more specifically in terms of their own professional development. They also tended to better articulate training's relationship to the roles and importance of non-management employees (such as designers and engineers) than did managers. Non-managers specifically connected improved professional knowledge and skills with the ultimate benefit of the company. In this regard they saw training results in terms of

- More productive employees; better specific or general knowledge of the product or company; better well-being for the employee which pays off for the [company] and its shareholders
- Improving the productivity of the employees; increase ESAT; open-up new job-related opportunities for employees; help retain talented employees; improve the overall competitiveness of [the company]
- Quality and productivity; higher morale; employee effectiveness and better performance; better communication of complex ideas and designs; fewer conflicts due to ignorance or differences in background; a professional skilled workforce that is keeping up with changes in technology
- A satisfied employee who can effectively perform assigned tasks; the outcome of assignments will be received by everyone involved management, employee, and customer increased satisfaction and sense of self which translates to bottom-line productivity

While both groups also recognized strictly personal training results, non-managers emphasized such results as illustrated by the following comments:

- Specific knowledge usable for employee for job at hand; general knowledge of the employee's field; personal skills usable on the job; general skills and knowledge of personal value to the employee
- a program which provides a balance between technical and non-technical courses as well as allows professional development in non-work related areas
- being kept happy with up-to-date technical training in their area as well as personal-interest courses

In contrast to such comments, managers made reference to organizational, business, and program objectives:

- Achieving a specific objective, be it specific skills required for a job or softer skills which can be applied generally; in the case of [our corporate division] these objectives should be driven by both business needs as well as organizational [needs]
- Does the program meet the objectives? Do the target audience accrue the value/knowledge desired? Evaluation involves collecting evaluation data, analyzing and presenting results to trainers and sponsors; the results should be used to determine if business requirements [are met]
- Metrics against objectives (defects, productivity)

Although non-managers also made reference to training's relation to such objectives (as described above) this group emphasized training results most related to job, professional, and career development. Both the written comments from part 1 (training evaluation) and those from part 2 (training evaluation) reflect the quantitative findings described. Comments from survey part 2 are discussed next.

Training Evaluation

Written comments obtained from both groups regarding training program evaluation were more general. In contrast to part 1 of the survey on stakeholder views of training results, there was a tone in the written responses that "training evaluation is not my specialty so please don't expect me to comment too knowledgeably or authoritatively in this area." The following manager comments support this view:

- I never heard of [training program evaluation] before today, therefore, I am not familiar with its objectives.
- What is this "training evaluation" thing? Are you talking about a pre-existing process, some new process, or simply the act of asking people to assess the quality of courses they have taken? I have assumed it is the latter.

The following comment provided by a non-manager also illustrates this view:

- You guys are the professionals; I have no idea how training programs should be evaluated.

Also, as pointed out in connection with the survey response demographics, such comments may help to explain the very slight decrease in the number of respondents for part 2 of the survey compared with part 1. One individual, a non-manager who completed the first but not the second part quantitative items of the survey, commented in the part 2 section:

> Was this survey [training program evaluation]? If so, I guess I should have answered the questions, if not, then I'm not familiar with [training program evaluation] and thus not in position to answer.

Nevertheless, many respondents did provide comments which serve to shed light upon and further explain the response patterns observed. The next section describes stakeholder comments provided in connection with the purposes of training evaluation.

Purposes

Neither group favored exclusively formative or summative evaluation purposes based on their written comments. Rather, both indicated a balanced view between evaluation for training program improvement and judgment. Representative manager comments supporting formative evaluation purposes included

- [training program evaluation] results in long-term curriculum improvements.
- Training evaluations should be used to continuously improve training.

Similarly, non-managers commented that training program evaluation

- [should] improve the quality of the existing programs; lead to the design of new programs to meet the new needs of the [lines of business]
- [leads to] a continuous improvement in the material presented in the training sessions and the presenters of the material
- result[s] in improved training programs
- [leads to] improved training programs; facilitate[s] employee course decisions
- result[s] in better training program
- [should be used to] improve [the] training program

Manager comments indicating a more summative posture included evaluation purposes to

- result in an accurate audit of the value currently being delivered by training
- ensure [the] program meets stated objectives
- identify the value to the company

Non-manager comments supporting this more summative perception of evaluation purposes included suggestions that training program evaluation

- results in determining program effects and goals
- [results in the] elimination or revision of ineffective programs
- [serves to] prune courses—discontinue some, add others
- [determines] whether the program is effective
- [serves to] evaluate the usefulness of the program
- [serves to assess] the effectiveness of the training program
- [allows evaluators] to see what has been gained from the program
- [helps to] remove ineffective training
- [serves to] to determine the degree of success
- [helps] to determine if the program should continue
- [helps] to decide which courses to keep

In addition to comments regarding generally formative and summative purposes, miscellaneous other comments focused on assessing instructor competence, facilitating team building, and benchmarking the training program against those in other firms. Beyond these perceived evaluation purposes, one non-manager implied a certain professional faith in training professionals (and perhaps reinforced a general view that respondents do indeed recognize training and its evaluation as special areas of expertise outside their own) by indicating the purpose of training program evaluation to be simply "whatever uses the training team chooses." Comments made in connection with training evaluation processes are presented and discussed next.

Processes

Written comments were also included pertaining to the training evaluation process. Corresponding to the survey, these comments were focused on the identification of (1) who should be involved in the process, (2) data required, and (3) the reporting of evaluation results. The following sections present written comments made by both managers and non-managers about these areas of the evaluation process.

Involvement.

Both groups made comments to indicate favoring a range of involvement in the training program evaluation process. In these comments many respondents specified a more precise hierarchical relationship for the involvement of immediate line management, that is, one level up from the training participant. Managers specifically mentioned the involvement of both the "immediate manager" of the training participant, as well as, "executive/senior management." Non-managers commented on the involvement of the following:

- senior business line managers
- managers
- trainees' managers
- immediate manager
- next level of management
- business line managers for future ventures
- immediate manager

The following comments on the involvement of training participants were also included:

- involve trainees perception of usefulness of training as applicable to their responsibilities
- to determine...if the program is meeting employee's expectations and needs
- feedback from trainees that are attempting to apply what they have learned

Of all comments provided by both managers and non-managers, only a few comments (by non-managers) implicating the involvement of training specialists were included:

- help course developers improve course content and presentation to meet the needs of the trainees and line management
- [training] specialists
- individuals who deliver training

In addition to suggesting the involvement of each of the three stakeholder groups several respondents identified several other internal and external groups. Managers suggested the involvement of "universities and other companies" as well as "external consultants who are experts in their area." Non-managers mentioned the involvement of

- individual contributors [ICs]
- customers
- auditors [ISO and quality]
- observation by external expert [individuals and groups]
- trainers (the ones training)
- subject matter experts (SMEs)

Data.

Substantially fewer comments were made about the kinds of data required for the training program evaluation process. In addition to the data formats explicitly stated in

the survey items included, both groups suggested several other forms of data related to the annual employee performance review process. Several non-managers further commented on the need to obtain feedback data from course instructors as well as training program participants as follow-up and performance data 1 month after the completion of a program course. An interesting comment was also made by a manager who simply stated that "some data are essential, but no individual data listed above are essential." This individual did not elaborate on what these "essential" data might be.

Reporting.

Comments about training program evaluation reporting included suggestions to report results to both management and non-management groups in the line organization as well as instructors of program courses. While, relative to the other categories for which it was possible to supply written comments, very few comments were included about the report audience, both managers and non-managers emphasized that any such results should be made widely available to any interested individual or group in the organization. One manager simply commented that training program evaluation results should be made available to "all stakeholders." Echoing this view non-managers suggested availability to

- all interested parties
- whomever applicable (based on need)
- anyone in the organization
- [the organizational] community

As an external reporting audience, one non-manager also suggested that training program evaluation be made available to "customers."

Consequences

A relatively few original comments were offered by either group pertaining to the consequences of training program evaluation. There are at least three possible reasons for this. The first of these is related simply to respondent fatigue as the comments fields for this section of the survey were all located on the third page (of the four-page survey). A second possible explanation is the general lack of perceived respondent expertise in evaluation. As discussed earlier, several respondents indicated that they felt "unqualified" to add extensive comments based on their limited evaluation background. A third reason is that the eight part 2 survey items (2.18 through 2.25) effectively covered and exhausted the gamut of consequence possibilities. Particularly in connection with the first reason (fatigue) by the time most respondents reached the additional comments section they may well have been eager to reach the last page to complete the survey. Nevertheless, some additional comments were provided here. These suggested largely instrumental evaluation consequences, for example, for course and program improvement as well as to assess whether training participant needs were met.

Summary of Written Comments

Rather than promote selective interpretation of the quantitative results discussed, the written comments presented and discussed should be viewed to augment those results. Brief comments were liberally provided by both managers and non-managers. With a few exceptions, most of these can be placed in one or several of the following categories: (1) comments that restated or reiterated one or more of the survey items (e.g., training should contribute to customer or employee satisfaction), (2) comments expressing a lack of expertise perceived as a requirement to respond "correctly" to the items in the second

part of the survey (e.g., I don't know much about evaluation so don't expect my responses to be very meaningful), (3) specific suggestions for course or program improvement (e.g., course notes should be made available to participants before they attend the course). Nevertheless, along with some of the more original comments which spoke more directly to the research questions, taken as a whole the comments should be viewed as a valuable addition to the quantitative results in providing additional information about respondent perceptions of training results and evaluation.

Phase 3 Limitations

Both general and specific limitations have been discussed regarding this phase. As described above most of these concern the quantitative aspects of reliability, validity, internal consistency, and generalizability of the findings. Regarding the qualitative data collected through the written comments, some additional limitations should be mentioned. First, the written comment sections of the survey were necessarily restricted. While many respondents did choose to use the limited space provided to supply such comments. By design, however, these were relatively brief and focused on the topical areas specified (training results and evaluation). While one respondent actually included a separate sheet of typed comments, this was clearly the exception rather than the norm. Hence, because this phase was concerned primarily with quantitative data collection, most of its limitations revolve around the quantitative limitations discussed above.

A second overall limitation concerns the scope of this phase. As discussed, sampling for this phase was done in a single division that is part of a much larger total corporate organization. While this division seems intuitively representative of both other divisions within the company (and perhaps the company itself), only repeated measures

involving larger samples can substantiate further generalization of results. As mentioned, this is certainly the case for generalizations beyond the case organization itself.

Phase 3 Summary

Even with the limitations mentioned, the results obtained in this phase have served to supplement and extend findings from the previous two research phases. In terms of the predicted relationships and research questions posed, perceptual variation regarding training results was found to be moderate. These findings generally correspond well with both the pattern matching relationships exhibited in phase 1 and the qualitative results of phase 2. While group views regarding evaluation were observed to depend moderately on training results in terms of employee satisfaction, each group emphasized different aspects of this construct.

Both the quantitative variation indicated about training results (in terms of employee satisfaction) and training program evaluation (in terms of instrumental-conceptual use) were also further explained by the written comments obtained. Managers perceived the importance of employee satisfaction more in terms of productivity and project requirements, whereas non-managers clearly expressed employee satisfaction more specifically in terms of their own professional and career development. This outcome can be further used to explain variation among the two groups based on each group's tendency to use evaluation both instrumentally and conceptually in ways that are congruous with their respective group's perceptions of training results. This conclusion is supported by both the univariate and the multivariate differences described.

Beyond this the results have also enabled further generalization to the case organization. As anticipated, based on both the original predicted relationships and the

results of the previous two research phases, the limited variation found can be understood in terms of both groups co-location within the core function of the organization. Organizationally, and from a business perspective, both groups are much more closely aligned and united in their focus on meeting external customer and market requirements. The training provider group (not included in the survey because of their relatively small numbers) on the other hand generally focuses on satisfying both of these core stakeholder groups as internal organizational clients. The implications of these results in the context of the overall study are discussed next.

Chapter 7

Discussion

The purpose of this chapter is to integrate the findings of the overall study. This is done with particular reference to the research questions, conceptual framework, and multiple research methods employed. Stakeholder group perceptions of training results and evaluation are integrated and summarized across the three research phases. Individual results from the three research phases have been presented with their initial implications in the three preceding chapters so references to these are kept to a minimum and used largely for illustrative purposes. As developed in the literature review, elements from the conceptual framework are also used to expand the discussion and to further develop several key implications.

The remainder of this chapter is organized into three major subsections. The first addresses stakeholder group perceptions of training program results and evaluation based on the findings of the study. The second discusses and develops the implications of these findings referencing literature and the conceptual framework. The third and final section of the chapter presents and discusses the limitations of the study overall.

Stakeholder Perceptions of Training Results and Evaluation

Each research phase has produced evidence of stakeholder group perceptions relative to the results or evaluation of training. **Table 19** presents a summary of the overall study findings based on an integration of the results obtained in the three research phases. The main stakeholder group perceptions related to training results and evaluation as presented in the table are discussed next.

Table 19. Integrated Summary of Study Findings

Stakeholder Group	Main Perceptions	
	Training Results	Training Evaluation
Sponsors	**Emergent indicators**—preconditions for business performance Focus: Customer, Market, Product Development • reduced productdevelopment time (time to market) • meeting and anticipating customer requirements • creating [company] differentiator as industry supplier of choice • understanding current market needs and industry directions • turning product capabilities into value for customer • improving employee appreciation of customer needs • improving product quality • improving project planning and project management	**Purposes:** training program improvement (formative) Customer Satisfaction (perceived product quality, value, support) Product Development (hasten new employee productivity; reduce time to market) Employee Satisfaction (meet perceived employee development needs) **Processes:** Planning---providers and sponsors Involvement---sponsors, participants, providers Data—multiple data forms; surveys, focus groups, interviews Reporting-- evaluation results available to all contributors and stakeholders **Consequences:** Instrumental Utilization (improve training program) Symbolic Utilization (enhance program credibility)
Participants	**Emergent indicators**—job performance and professional growth Focus: Product Design and Employee Development and Satisfaction • attracting and retaining key employees (best & brightest) • developing employee loyalty • improving product quality • disseminating "lessons learned" knowledge among employees • reduced design cycle times • improved product designs (hardware, software, firmware) • improved employee interpersonal and communication skills	**Purposes:** course and program improvement; (formative) Product Development (improve product design and project execution) Employee Satisfaction (meet personal and professional development needs) Customer Satisfaction (perceived product functionality and quality) **Processes:** Planning --participants and sponsors; providers in consultative role Involvement---sponsors, participants, providers Data --multiple data forms; surveys, focus groups, interviews Reporting—evaluation results available to all contributors and stakeholders **Consequences:** Instrumental Utilization (course selection; aid professional development planning) Conceptual Utilization (information for providers to improve training program)
Providers	**Emergent indicators**—organizational and business support Focus: Support espoused internal client operational and strategic goals • support of client business and operational objectives (e.g., reduce time to market, improve quality, leverage technology, share lessons learned) • defining a clear linkage between business and training program objectives • development of project and job related employee knowledge and skills • effective transfer; swift use of training knowledge and skill on the job • development of core expertise and essential scarce skills and knowledge • builds employee capacity and skills to execute broader and more complex tasks • universal access and availability of training across dispersed sites	**Purposes:** program improvement; demonstrate value (mixed) Improved Employee Knowledge and Skills (tool use, job application, learning styles) Internal Client Satisfaction (perceived value and responsiveness) Demonstrating Training Program Value (e.g., in terms of product development, employee and customer satisfaction) **Processes:** Planning—providers lead; sponsors as clients Involvement---sponsors, participants, providers Data—multiple data forms (responsive to client's perceived needs) Reporting--- sponsors as main audience; other reporting as needed **Consequences:** Instrumental Utilization (program funding, justification, advertising, expansion) Symbolic Utilization (demonstrate program success, value, provider expertise)

Program Sponsors

Training program sponsors emphasized training results leading to improved business results through customer satisfaction, market competitiveness, and product development. A predominant view among members of this group was that employee learning gained through training should result in continuously improving customer satisfaction, and ultimately business performance. This would come through quality and productivity gains achieved through training. Adjunct benefits would serve to ameliorate the management task and contribute to executive management's perception of an effective, efficient, and productive divisional management team.

In brief, training results were perceived to be ultimately instrumental for improving the business by growing market share to compete within the global marketplace. As such this group saw the results of training (phase 1) as having to do with helping to position the company as the industry supplier of choice through its ability to meet and anticipate customer requirements, even when the customer doesn't know them. Training results should support an increased ability for the organization to turn product capabilities into value for the customer and get employees to appreciate the customer's viewpoint, not just the employee's own technical specialty.

Along the critical path to these business outcomes, training results were also perceived by this group strongly in terms of effective and efficient product development. Specifically, training should lead to reduced time to market (TTM) by speeding project deliverables and reducing design cycle times. But training should also lead to significant product quality improvements. Training would further result in new employees becoming productive as quickly as possible. Such training results would facilitate the

managerial and product development process through improved project planning and project management. This would be done specifically by clarifying project goals and decreasing maintenance efforts and costs related to software developed (a major project and work activity of this division).

The training program would further improve collaboration and knowledge alignment within the division. From the sponsor perspective the development of critical and core organizational expertise also had an instrumental purpose to stimulate and maintain essential scarce skills, improve teamwork, encourage the reuse of information, and increase organizational learning specifically to capture and redeploy intellectual property within the division. Ideally, the training program would also result in a high level of employee satisfaction as well as support their interest and motivation to continue learning.

Overall such training results would effectively make life easier for managers. The sponsor group stressed the importance for training to result in less time correcting mistakes, fewer recurrent problems, and more effective management. Training would prepare staff for development programs not yet launched, facilitate employee job transitions between functions, and better support the strategic direction of the organization. Training would further serve to simplify the learning efforts required of newly-promoted managers, improve employee understanding of organizational culture (how they fit-into the organization), and develop employee loyalty. It would help to integrate employee professional knowledge and skill with the real and potential needs and wants of the customer and market.

In terms of the traditional and emergent perceptions predicted for this group, while program sponsors did not specifically cite traditional themes associated with ROI, they did emphasize the prerequisites for such indicators that were perceived to be within their respective spans of control as managers of the middle line. Training results categorized as emergent indicators (Table 1) were seen as instrumental to the managerial task. Employee satisfaction, for example, was not viewed as an end, but rather as a means toward sustained organizational and business effectiveness. The traditional results were viewed as inevitable byproducts of the emergent indicators specified. Moreover, as middle line managers within a (large and important but nevertheless) single division of a much larger company, the program sponsor group did not perceive the traditional outcomes as their immediate problem. Rather, these were the concerns of executive and corporate management. Because (as training program sponsors) the performance of the middle line managers is evaluated more in terms of project and product deliverables, this group emphasized training results that contributed to those deliverables.

There was a good correspondence between program sponsor perceptions of training results and training evaluation. Evidence was produced to support the conclusion that program sponsor views of training program evaluation do depend on the organizational results they perceive for the program. To briefly review, the first research phase demonstrated that program sponsors viewed both the results (G) and evaluation of training (T) very similarly based on the relatively high positive pattern match correlation coefficient obtained ($\underline{r} = .74$). This suggests that program sponsors view the training results they perceive to also form the basis for its evaluation. Referencing the predicted relationships outlined (Table 2), although the results of research phase 2 indicated that

sponsor views of evaluation were generally more formative than summative, the group also agreed ($\underline{M} = 4.10$) with the phase 3 survey statement reflecting the perception that "Training program evaluation results should be used mainly to determine if the program is meeting its goals." Hence, while perceiving training evaluation mostly in connection with program improvement, the primary role of sponsors as managers fosters a more goal-oriented view of evaluation in terms of accountability. This also explains the group's general preference for quantitative, outcome-oriented (survey) data in the evaluation processes and is expanded on further below.

Program sponsors indicated a general preference to have themselves and training providers mostly involved in the evaluation planning process. As revealed in the interviews performed, the time of training participants (as the core knowledge worker group directly involved with product development) is better spent on developing product rather than planning evaluations. While recognizing the central role of participant involvement in evaluation, sponsors perceive this role more in terms of end-user satisfaction with the training program overall. This further explains the approval indicated by the sponsor group to have training participants serve mostly as data sources using multiple data forms, and to make the results of evaluation available to participants as such.

The sponsor group perceived the consequences of training evaluation mostly in instrumental and symbolic terms. In correspondence with their mostly formative view of evaluation purposes, the group views the results of evaluation in terms of program improvement and to enhance the general utility and credibility of the program.

Training Participants

As mentioned, training participants represent the main non-management training consumers. This stakeholder group was originally predicted to perceive training results and evaluation largely in terms of the emergent indicators related to their own professional growth and development as knowledge workers in the high-technology industrial sector. The findings produced across the three research phases do, indeed, support these predictions.

The main work responsibilities of this stakeholder group consists largely of the design, development, and systems integration of fiber-optic transmission software and hardware. The range of tasks performed by this group is wide spanning the lowest (instruction and line-level programming and component-level design and specification) through to the highest (systems) levels of design and integration. Much of the work performed by members of this group is done in the context of project teams that report to a project team leader who, in turn, reports to a project or departmental manager.

Training participants emphasized training results that most directly contributed to roles in the product design and development environment. From the phase 1 research, the conceptual cluster ranked highest in average importance in terms of both general and training program evaluation importance was labeled simply "design quality" by members of this group. This reflects the group's view that training should serve to improve modular software design methodologies, give software designers better ability to write efficient, high-quality code, and enable better hand-off between functions (e.g., hardware designers to board layout; software designers to verification). Even from the perspective of what this group conceptualized as people versus business management, they

emphasized the perspective of the employee by specifying training results that foster networking (between employees and across departments, divisions, and functions), as well as shared, collaborative, team learning. The groups also promoted the usage of in-house expertise to enable less dependency on external expertise perceived to be much higher in cost. From a practical perspective this group categorized the integration of training with on-the-job learning as a dimension of learning improvement.

This group's view of the training program's contribution to employee satisfaction clearly emphasized the perspective of the employee. Ideally, the training program would contribute to an employee's sense of professional or self marketability. It would ensure that employees receive credit, acknowledgment, or rewards for their learning achievements as well as give employees increased control of their training and knowledge resources to support personal broadening and job enrichment.

Because the divisional culture has a history of supporting the development of employees with particular expertise or experience as internal subject matter experts for the purpose of teaching within the program, this group also recognized and emphasized their contribution in this area. From the perspective of participants, the training program should further result in learners becoming teachers and mentors to others. Training participants recognized the importance of sharing knowledge and further perceived that those employees who do teach should be better recognized by management for their efforts in disseminating intellectual capital in the organization.

This group both recognized and emphasized their position within the organization as key resources based on their knowledge worker roles. As a part of the phase 3 research, an anonymous hardware designer also included a separate sheet of comments

along with his completed survey[18]. This sheet contained a general overview of this individual's overall training philosophy as well as three concisely written sections corresponding to the first three sections of the survey. In outlining his general philosophy of capitalizing from internal expertise and intellectual capital within the organization he stated:

> Cross "lines-of-business" technical support, should be available so people developing laser drivers, for example, in OC-192 land can benefit from the lessons learned by OC-3 land. So the corporation as a whole does not need to relearn about laser drivers!! This is one example of the organization benefiting from its own knowledge, and not wasting time learning what it already knows!! Such examples exist on all levels; within [the company], within divisions, even within departments...There is a need to actively recognize those people within [the company] who transfer knowledge freely so others can do their job efficiently. This "knowledge transfer" could be a complete set of documentation, a living web site, or some other means whereby valuable company knowledge is made accessible.

The individual went on further to emphasize training results with high perceived value that directly supported the employee. This included suggestions that training should ideally result in employees being fully versed in the existence, availability, and access details regarding all the hardware and software tools and resources available to them relevant to their jobs. He further noted that the training program should result in

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[18] Presentation and discussion of this data was deferred until now because of its illustrative utility.

new people not wandering around lost, and being dependent on "hear-say" (i.e. only gathering useful information by talking to people. After all, how do they even know who to talk to!??)

In his latter comments, this designer went on to highlight the "nitty-gritty" details that only an employee in this role would likely make regarding training results and evaluation. The following comments resonate with themes of training transfer (Broad & Newstrom, 1992) and the increasingly popular notion of action learning (see, e.g., Bierema, 1998; Dixon, 1998; Gale, 1994; Raelin, 1997; Revans, 1983, 1998):

> Most technical training is on-the-job, so the training should be on-the-job not in the classroom. For example, in the Hardware Lab, hire people who really know how to use the equipment. It would be THEIR responsibility to train/aid engineers in setting up the equipment. Some tests are only done a few times, but may take many days/weeks to figure out:
>
> 1. what equipment is to be used/best to use
> 2. how to se it up/configure it
> 3. if there are any other pieces of equipment that should be used with it (for example, to prevent equipment damage, such as an input filter)
>
> There should be equipment/technical gurus in the lab, who are NOT responsible for stockroom control. These gurus are NOT lab technicians!! They would be equivalent to an IC7 [individual contributor, job-band 7 this is equivalent to a departmental manager in hierarchical status but an IC is more of a subject-matter expert than a traditional departmental manager] position, knowing all the equipment, as well as being an expert in the technical aspects of testing optical

systems (i.e. knowing all about eye diagrams, waterfall curves, etc. to name a few). They should become experts in the use of the equipment, and be the ones most knowledgeable for the ordering of new equipment. And please, let the new hires (and those of us who have been around awhile) know who these gurus are and what their responsibility is!!! The gurus should be highly visible, approachable, and able to communicate well. This should be a recognized job position.

Comments such as these are typical and were reflected in the phase 2 qualitative research results describing evaluation views. From the perspective of the employee, training is perceived to result in knowledge and skills targeted to the job and the professional growth and development of the employee either within or without the company. As professional engineers, designers, and technicians, such aspects of knowledge and expertise are obviously valued for both the instrumental purposes relative to the job, and in the larger context of professional practice independent of any particular company or organization.

As did the program sponsor group, the training participant group's view of training program evaluation closely matched their view of general training results. The phase 1 pattern match correlation performed between participant views of general and training program evaluation importance ratings was positive and relatively high ($r = .65$). Again this illustrates that training participants did not exhibit great variation between the importance they ascribed to statements as general results compared to the same statements in terms of evaluation importance. Again, similar to the sponsors, this stakeholder group's views of training program evaluation did depend on the results they perceived for training.

The purposes of evaluation were perceived by this group in mostly formative terms for program improvement—particularly as the sum of improvements made to program individual learning interventions (courses) that the group directly encounters on a daily basis. Training participants displayed a wide view of program evaluation involvement, data, and reporting including all three stakeholder groups using multiple data forms. The group did not display a preference for any particular mode of reporting, but (as with most other forms of information these days) endorsed the idea of making evaluation report results available to all via the internal corporate intranet.

Of the three groups studied, only sponsors and participants responded to the phase 3 survey which indicated moderate perceptual variation between the groups. While the participant (non-manager) group agreed significantly ($p \leq .001$) more strongly than did program sponsors (managers) to the part 1 item "The main purpose of training should be to develop employees professionally" both the univariate and multivariate tests did not provide evidence of strong group variation. Beyond the technical limitations of the analysis (described in connection with the phase 3 results and limitations) this result might be explained by at least two points.

First, as mentioned, the managers who participated in the survey were those of the middle line, rather than corporate executive management. As such, this group of managerial program sponsors have a close working relationship with the designers, technicians, and engineers that report to them. Given the increasingly project-driven environment of the division, both the success of the non-management members of any given project team, as well as the success of their managers is determined by the results of the project. Project success is determined largely by meeting specified, monitored,

progress relative to the project charter, schedule, and deliverables. A second reason for these results might be explained by the organization's strong history and culture. In this particular organization, it is a well-known fact that by far most managers are recruited, or otherwise "work their way up", from the ranks of the non-manager (training participant) level groups. Both the business of the organization and the professional credibility of the manager among the highly skilled pool of workers requires a generally perceived high level of technical, job-specific knowledge and expertise.

The consequences of evaluation perceived by this group also matched their perceptions of its purposes. Because the group views training as a means to meet both their job responsibilities and professional development needs, the consequences of evaluation were perceived mostly in terms of course selection (instrumental use) and program improvement (conceptual use) which was viewed a the primary responsibility of training providers.

Training Providers

The training provider stakeholder group consisted of training specialists and their managers who are regular, full-time, employees of the company, but located within a separate division from the two previous groups. As mentioned the training provider group is part of a combined training and documentation group which provides services throughout the company.

Looking across all three stakeholder groups studied, the views of training providers varied much more widely compared to those of the sponsor and participant groups. Although, because of their relatively small numbers, members of this group did

not participate in the phase 3 survey, evidence from the first two research phases supported this group's distinctive view of training results relative to evaluation.

Training providers perceived training to support the espoused operational and strategic goals of their internal clients. As such they viewed the importance of training results very similarly compared to both sponsors and participants. This was reflected by exceptionally high pattern match correlation coefficients obtained in the phase 1 research by comparing this groups view of training results with both sponsors ($\underline{r}$ = .78, .87) and participants ($\underline{r}$ = .81, .73). They conceptualized these results in terms of two respective concept map cluster titles in terms of benefits resulting from training, and customer value. The statements comprising these two clusters were ranked highest in average importance ($\underline{M}$ = 3.72; 3.71 respectively) and contained statements indicating that training should result in reduced time to market, significant product quality improvements, better support of the strategic direction of the organization, and an improved ability to leverage change in the technology to the best advantage of our company and our customers.

Training providers further echoed and emphasized program sponsor views by emphasizing training results that directly supported the external customer. The view that the training program should result in support for customer strategic and operational objectives was rated as extremely important ($\underline{M}$ = 4.85). They also rated the importance of statements describing training results perceived to be specifically beneficial to program sponsors and line managers high in importance. Examples include training results that narrow the gap between how a designer thinks and how our customers think;

less time correcting mistakes and fewer recurrent problems; and developing the ability for the organization to meet and anticipate customer requirements.

In contrast this group rated training results that were organized into two conceptual clusters described as effective training program attributes, and skills and knowledge lowest in average importance. Both of these clusters included statements indicating training results that are ostensibly within the purview of this group to more directly affect. These included training results concerned with obtaining certified special skills (e.g., project management and code inspection), employee communication skills, service management skills, tool knowledge and proficiency, addressing training needs, swift/immediate knowledge use, training integration with university-industry interaction programs, and addressing individual learning style(s) by optimization of learning media.

This group's view of training program evaluation was found to be negatively correlated with their view of training results. In sharp contrast to the sponsor and participant groups, the training provider group did not rate or discuss the importance of training results similarly to that of training evaluation. Strong negative pattern match correlations were found both within the training provider group and between this group and the others. Within the group, the pattern match correlation between statements rated as training results and the same statements rated in terms of training program evaluation importance was a strong negative ($r = -.75$). Furthermore, the pattern match correlation between statements rated in terms of their importance as training results by program sponsors, and these same statements rated in terms of their training program evaluation importance by providers was profoundly negative and almost exactly opposite ($r = -.94$). The same pattern match with reference to the participant group was also negative, but

less so (r = -.40). These results were discussed earlier in connection with the phase 1 results and are developed and expanded further in their implications below.

Evidence was also produced to support and explain these results in phase 2. Training providers emphasized a theme to use training program evaluation to secure funding for, and further expand their services among internal sponsors and clients. While, on one hand, such a view might be explained in terms of the provider group's sincere desire to meet or exceed client expectations, there was clear evidence that this group also perceived such service growth and client satisfaction as a main basis for their corporate existence. Such attitudes were perhaps most strongly held by training managers. This is understandable because these managers are often cast into the role of internal training account executives who work the "front lines" in the perennial battle to secure and sustain internal funding to support their services in the organization. The comments of a senior training manager describe this view well:

> [Evaluation results should be used mainly] for recognition, for advertising. If we do a good job evaluating training then we can make the training better and better....So it will lead to changes, in improvement to the course marketing. You can get more people coming in.

Another training manager stated:

> I am a service provider and my opinions are totally different when it comes to dealing with training from the person who is paying the money.

Based on the findings of both research phases involving this group, it was clear that in addition to depending on the organizational results they perceived for the program,

training provider views of training program evaluation also depended on their perceptions of its ability to satisfy internal clients to secure budgetary program funding.

Emphasizing their area of expertise relative to training, the provider group perceived themselves to be in a lead role in evaluation planning process. Due to the consultative nature of their work they see themselves as providing responsive services to their main clients (program sponsors). Providers perceived multiple data sources and stakeholder involvement as well. The main reporting audience was perceived to be the sponsor group. Provider perceptions of evaluation consequences emphasized instrumental and symbolic forms of utilization related to justifying, sustaining, and expanding the program.

Summary of Findings

Stakeholders perceptions of training results were shown to differ moderately. All groups recognized similar training results that were considered desirable and important as organizational results. However, variation was seen in the relative emphasis placed upon these results. Looking across the stakeholder groups and study phases, sponsors and training participants showed differences in the results they emphasized. Sponsors, as managers, emphasized customer, market, business, and product development results. While also recognizing customer-related results, participants, emphasized design quality, job, career, professional, personal, and technical knowledge results. Training providers echoed a combination of results perceived by both sponsors and participants (as their main clients), but they identified more closely with the views of the sponsor group (as the group with the most direct influence on internal training funding decisions).

Each group's view of training results was seen to influence their respective views of evaluation. Among program sponsors and participants this influence was relatively subtle and each was seen to be somewhat complementary to the other. Each of these two groups emphasized a slightly different set of training results and these views subtly affected each group's view of training evaluation, but the structural proximity and organizational interdependency of the groups was seen as a potent force in moderating this variation. On the other hand, in addition to depending on the organizational results they perceived for training, provider views of evaluation were seen to also depend strongly on the vitality of both the program and their jobs in administering it. The following section serves to further explain and develop the implications of these findings within the context of the literature and conceptual framework.

Implications Within Conceptual Framework

This section revisits the conceptual framework and relevant literature to expand and further develop the findings of the study discussed above.

Elements within the complex organizational context in which training and its evaluation occur

Evaluation and Organizational Theory

The study implicates both evaluation and organizational theory. These are both emphasized in the conceptual framework presented. Yet the integration of these two theoretical realms is in its infancy. Indeed, the first linkages between these domains have only recently been forged. In observing that "there has been little research or theoretical development linking organizational theory and evaluation" Rogers and Hough (1995, p.

321) reviewed five different perspectives on organizations in connection with evaluation effectiveness. Although they include it as one of the five perspectives, these authors questioned the unified, rational, view of organizations as orderly and predictable entities. They further recognized the complex nature of organizations in which "programs can be said to construct realities that match their assumptions." (p. 322) The five organizational perspectives they discussed are useful to the present study because they provide an additional basis for exploring its findings.

Contrary to the initial prediction that program sponsors would adopt a more summative view focusing on program worth as based on traditional organizational theory, the findings suggested they actually had a more formative evaluation perspective related to program merit and improvement. The "managerial hierarchy perspective" of evaluation described by Rogers and Hough suggests an explanation:

> This perspective is based on the assumptions that "decision-makers and managers are constantly in search of ways to improve performance" (Floden & Weiner, 1978, p. 10). Therefore a "good" evaluation is one which provides decision-makers with the information they request and can be utilized for program improvement. (p. 324)

This perspective judges the quality of an evaluation based on its ability to meet its objectives for rational decision-making for program improvement (see also Stufflebeam & Webster, 1988). Furthermore, the evaluator acts in the role of management consultant using client satisfaction as his or her main criterion for assessing the success of the evaluation. This perspective fits some of the findings obtained in the present study because, although sponsors exercised the greatest relative control over program budget,

they also discussed training as an essential service to be steadily improved. In responding to the phase 2 question about the (formative or summative) purposes of training evaluation, the sponsor group's (TCC) chairman stated

> I think [the purpose of evaluation is] both [formative and summative]. In some ways by definition improvement is tied to judgment. So the objective is to improve it. Judging for the sake of judging is not very valuable. Is it 50/50? Is it 70/30? The objective is to make it better. I don't think that we have an option not to have a training program.

Of the collective of program sponsors occupying the TCC, this standing group chairman is the person with direct sign-off authority for the annual program budget. As outlined above, the managerial hierarchy perspective explains his leaning toward formative evaluation. Assuming the need to budget for and fund the training program (as essential), a formative evaluation focus becomes paramount because even though summative results may suggest the program should be curtailed or cancelled there is no option "not to have a training program."

The views expressed by the TCC chairman about the role of evaluators also squares with the managerial hierarchy perspective. In responding to the phase 2 question about what data is required for evaluation, he replied "I honestly don't know. I'm looking for professional advice here." In looking to the training provider group to take a leading role in evaluating the program, this view clearly casts the evaluator in the role of "management consultant" as described by Rogers and Hough. But if the training evaluators are recruited internally from the ranks of the training program providers (who not only have a clear and direct stake the program's funding level but also in its

implementation) their evaluation recommendations might reasonably emphasize the status quo of program funding and operation because they are vulnerable to outsourcing. What organizational evaluation perspective explains this view?

The "street-level bureaucrat" model assumes that workers will resist hierarchical control and managerial attempts to alter their routines. Firstly, because these things are a concrete expression of their status; and, secondly, because they represent informal coping processes which are essential to the containment of the work. Because of this resistance, organizations fight to remain the same regardless of evaluation findings. Program providers in the present study exhibited some of these characteristics in attempting to use evaluation to maintain training program operation. According to Rogers and Hough, the street-level bureaucrat perspective also involves calls for professionalism and concern for individuals rather than numbers. This encourages program staff to concentrate on servicing existing clients, rather than questioning whether the service needs to change to meet the needs of those who do not use the service. As discussed, supportive evidence was obtained (particularly in phase 2) regarding provider group views related to training professionalism as well as their focus on meeting existing client needs before expanding their services to potential organizational clients. The training provider group involved viewed their current internal client as foundational to maintaining their resources. The following organizational evaluation perspective links competition for resources to power among stakeholders.

Based on the view that common goals are largely unattainable, the "collective bargaining perspective" acknowledges that unequal resources and power will lead to competing interest structures or coalitions relative to evaluation. Even so, differentials in

power and resources among evaluation stakeholders "...will probably never be openly discussed" according to Rogers and Hough (p. 328). They further noted that no approach to evaluation responds to the issues raised by the collective bargaining perspective:

> Even where conflict is recognized in an evaluation (for example, Palumbo & Hallett, 1993) there are no suggested methods or theories to deal with it. The failure to effectively link corporate management evaluation techniques such as performance indicators to budget decisions (Winston, 1991) may be largely due to the assumption that participants will cooperate with the process, rather than continue their competition for resources. (p. 328)

As discussed the three stakeholder groups studied in the present research clearly had differing resource availability, stakes, and organizational power. While the findings by no means suggest hostile or irreconcilable schisms between the groups (as members of the same company), these differences did serve to color their perceptions of evaluation relative to the training program. The multiple research methods employed in the current study enabled the collection of data describing some of these differences. The centrally featured stakeholder-based framework has assisted in interpreting and developing the findings. The next section further explores these specifically in terms of stakeholder-based evaluation.

Stakeholder-Based Evaluation

The findings of the present study support the increased use of a stakeholder-based approach using multiple applied research methods in corporate training evaluation. Although stakeholder-based evaluation has been the exception rather than the rule for corporate training, the reasons for this have not been widely discussed in the training

evaluation literature. Perhaps this is due to the weak linkage between the training profession and the field of evaluation as theoreticians and practitioners in evaluation have long considered the multiple group perspectives involved with a stakeholder-based evaluation. For example, Mark and Shotland (1985; pp. 605-606) stated:

> Evaluation, in theory and in practice, increasingly acknowledges and accommodates the existence of multiple groups interested in evaluation results. The need to incorporate in an evaluation the interests of multiple groups has been acknowledged by evaluators with markedly different perspectives (e.g. Cook, 1985; Cronbach et al., 1980; Guba and Lincoln, 1981; Patton, 1980) using a variety of terms such as "constituency analysis," "pluralism," and the "policy setting community.

Within this framework stakeholder values are key. Although derived in reference to the evaluation of public programs this framework provides a useful heuristic for the present study because it also recognizes how the independent and continuous dimensions of stakeholder power (the ability of a group to influence policy decisions involving the program being evaluated) and legitimacy (the perception that the stakeholder group's interest in the program and its effects is socially acceptable) are likely to influence stakeholder perspectives of evaluation.

Using the results of the current study, each of the stakeholder groups considered can be placed along the dimensions of power and legitimacy regarding the training program. All three groups have an obviously legitimate stake in the training program. As the group with the most direct budgetary influence over the program, however, sponsors are highest in power relative to the other groups. Although it can be argued that

sponsors also have a high stake in the success or effectiveness of the program, providers are seen to have the most at stake as the group most immediately susceptible to program budget cutbacks or outsourcing. Because (as pointed out) training is a necessity in the organization, whether it comes predominantly from internal or external sources, people (training participants) will always have access to training in some form. For this reason, participants are seen as positioned between the former two groups in terms of both power and legitimacy relative to the program.

Viewed from a multiple stakeholder perspective the evaluator faces not only technical but also political challenges in the organization. As demonstrated by the results of the present study, these challenges are most evident in the contrasting perceptions of program providers and sponsors revealed regarding training results and evaluation. As described by Bunker (1978, p. 129-130) such differences might be explained by political and role differences related to differential organizational power:

> The planners and evaluators have tended to be specialists and technocrats with allegiance to professional norms, while managers of field activities tend to be tied to politically accountable hierarchies with interest not only in program performance, but also in conserving their power....Similarly, the capture, analysis, and use of evaluation data is arduous and tricky. The evaluator faces both technical and political challenges. Even when the task of gathering, analyzing, and reporting meaningful data can be mastered technically, the unacceptable result remains a serious and oft encountered problem (Meyers 1975). The perspectives of the evaluator and of the program administrator and his political sponsors are sufficiently different.

As demonstrated by the results of the current study, a stakeholder-based evaluation approach has the potential to at least identify (if not resolve) differences in the perspectives of the parties involved.

Interestingly, in contrast to the raft of training evaluation efforts that have been referenced in the professional training literature, the few articles that have been published describing the use of multiple-stakeholder approaches to training evaluation have shifted their focus away from the popular search for training ROI. For example, McLinden and Trochim (1998) argue for the involvement of multiple groups and the use of concept mapping and pattern matching to reveal the degree of consensus, correspondence, and consistency among stakeholders. Also, in discussing the need to move beyond traditional views of training evaluation in terms of ROI, Moad (1995) described the application of concept mapping and pattern matching in the Professional Education group of Arthur Andersen Company to evaluate training in terms of stakeholder expectations. This group has abandoned attempts to evaluate training in terms of ROI. According to Moad (p. 46), "Most of the training ROI studies are just seen by management as promotion and marketing by the training department." Although this perception among the management sponsors involved in the present study did not come through with the bluntness reflected in Moad's comment, the tendency for internal training providers (training department) to promote and market training through evaluation was clear.

Yet such motives walk a fine line between justifiable group self-interest and exercises in organizational power and politics. Some have discussed such evaluation self-interest in terms of co-optation in connection with internal evaluation (see e.g., Cooley, 1980; Kean, 1980; Kennedy, 1983; Mathison, 1991) however, the scarce

discussion in the professional training literature about the political side of training evaluation remains. The following discussion considers some of the implications of the study in this area.

Power and Politics

No individual or group openly chose to discuss either training results or evaluation explicitly in terms of organizational power and politics. Although the training provider group perhaps came closest, even their remarks and comments were largely couched in terms of internal client satisfaction or rationalistic views of results perceived as generally favorable by all stakeholders. Yet, as has been pointed out, both organizations and individuals within them generally resist such open discussions. According to Patton (1997, p. 344):

> We found that many evaluators disassociated themselves from the political side of evaluation, despite evidence throughout their interviews that they were enmeshed in politics.

If this is true for evaluation in general, it is also clear for corporate training evaluation. Much of the training and human performance professional literature demonstrates a clearly self-serving tendency to use evaluation to actively promote both the products and profession of training. A good number of articles from this literature pool have been cited in the current study. As pointed out, many of these have focused upon the financial return on training as well as its contribution to profitability and business results.

Especially in view of the empirical findings presented, the argument can be developed that the professional societies and organizations associated with the business of training, performance, and human resource development are themselves pursuing a

political agenda on behalf of the profession. This has to do with legitimizing and strengthening the organizational power of both internal staff and external consultants who provide training services. Training evaluation in terms of ROI has become a mantra throughout the profession.

But the continuing viability of this type of training politics depends on a mainstream organizational ideology that has become so ingrained. This continues to promote functional rationality and fosters ROI thinking in connection with training evaluation. Even so, this ideology has its own political underpinnings. In pointing out that the literature of management is political, Pfeffer (1981, pp. 14-15) noted:

> The argument, then, is that the very literature of management and organizational behavior (as well, we might add, of much of economics, though that is a topic worthy of separate development) is itself political (Edelman, 1964), and causes support to be generated and opposition to be reduced as various conceptions of organizations are created and maintained in part through their very repetition. In this literature, efficiency-enhancing or profit-increasing behavior are not being taken as hypotheses about motivation and causes for action, but rather as accepted facts.

In view of the framework developed for the present study, such a view further serves to connect and integrate organizational politics with training evaluation. It also provides an additional dimension for considerations of organizational effectiveness and helps to explain the enduring ROI language of training evaluation incessantly pitched to the management in these organizations. So if evaluation in general and training evaluation in particular tends to succumb to the political language and predispositions of the

organizations where it is practiced the complex organizational context becomes a vital consideration in training evaluation research and practice.

In addition to the political nature of management and organizational literature noted by Pfeffer above, others have also flagged similar difficulties associated with organizational effectiveness theory. For example, Hall (1980) critiqued the goal attainment model based on its oversimplified view and failure to account for multiple perspectives and goal diversity. More recently Perrow (1992) connected such problems to the widespread and uncritical adoption of elitist ideology:

> Next, I question the assumption that efficiency can be addressed by examining survival, legitimacy, growth or profits, thus neglecting the multiple stakeholders within and without the organisation with quite different notions of efficiency or goal achievement. ...I have long proposed that organisations be seen as contentious arenas where people within and without the organisation seek to use it for their own ends, and that organisations were bound to generate negative externalities or social costs. Yet measures of one, or at most two or three goals, continue to dominate our studies. The financial measures used by organisational elites (and taken over by us) are recognised in the management literature as uncorrelated, and garbage-can theory observes that even the heads of organisations are not of a piece regarding the uses they wish to put their organisations. But our basic notions or organisations fundamentally resist the implications of multiple and unstable goals, in part, I suspect, because the elites are reluctant to acknowledge this and we are more subject to the reality construction of organisational elites than we care to acknowledge. (pp. 371-372)

Perrow's comments have several implications in relation to the framework used in the present study. First, he acknowledges the limited view of organizational effectiveness based on the neglect of multiple stakeholder perspectives. Second, Perrow implies a constructivist view of organizational performance related to financial measures and fostered by the elites of the organization. Third, he emphasizes an open-systems view of the organization in terms of its negative externalities within the larger context of society. Referencing the current results only one study participant (a senior manager in the sponsor group) indicated a view of organizational success in term of training results external to the organization beyond the customer or market. In reflecting on possible omissions in his group's phase 1 view of training results he commented:

> The other one [training result] I was thinking of is there is no theme of society here, it is strictly customers and market, it's not [the organization's] contribution to the betterment of the world as it is. That would maybe be closer to employee development, organizational/corporate and society inter-relationships.

This comment is particularly useful to point out that, beyond the differential group emphases placed on the results and evaluation of training, all groups adhered closely to an implicit set of assumptions within a well-entrenched set of conceptual boundaries regarding organizational effectiveness and success. As noted above, this same set of boundaries is seen to influence mainstream views of training evaluation. While it can be argued that these influences are also related to adjunct limitations of the Kirkpatrick model (see, e.g., Hale, 1998; Lanigan, 1998) the conceptual framework and methodological approach used for the present study highlights the organizational role, power, and status of the knowledge worker. This is considered next.

Knowledge Workers and the Power of Intellectual Capital

Program participants as the main knowledge workers in the organization have neither official accountability for training program budget spending nor a high stake in whether there is such a budget at all. As described, the findings of the present study suggest that this group views both training and its evaluation in terms of their own professional growth and development. But, unlike the minimally technically skilled manufacturing workers discussed by Darrah (1995, see Chapter 3), the program participant stakeholder group in the present study constitutes a specific set of knowledge workers that can be broadly conceived within the information technology (IT) sector. Even among Darrah's workers he pointed out that "knowledge was a commodity that could be transferred from person to person...It brought power to those who possessed it, so that it was bartered among workers and became a basis for informal networks of co-workers." (p. 33) If this was true for Darrah's workers, it is most certainly true for the knowledge workers studied here. Furthermore, from this perspective it can well be argued that, in developing their collective intellectual capital, training contributes directly to the power of this group in the organization. The implications of this are considered next.

The scarcity and inter-corporate competition for IT knowledge workers has been described and is receiving increasing attention (Caplan, 1995; Lee, 1997) and it is further sensationalized and commonly discussed in the popular media in terms of "corporate raiding" and "brain drains" scenarios in which companies, or even nations compete to attract such employees. Even in the absence of media hype, there is a reasonable basis to

believe that such workers must hold a certain amount of organizational power based on their individual and (especially) collective intellectual capital. Several management authors have recognized this (Drucker, 1993a, 1995; Pfeffer, 1994; Pinchot & Pinchot, 1993).

The basis for power among such individuals has been described variously. According to Pfeffer (1981), French and Raven (1968) described expert power as power that comes from possessing specialized expertise. Expanding on these notions, Mintzberg (1983) labeled this type of power in association with that possessed by the "professional operators" within the organizational "system of expertise":

> Professional operators have an important basis of power—the possession of critical knowledge and skills. This means that alone or in small groups, they must be given considerable discretion in their work, and so come to amass a good deal of power. This is enhanced by the fact that the professional operators generally provide a skill which is in great demand, resulting in a good deal of job mobility. As a result, their dependence on the organization is reduced as is their commitment to it. In other words, ideology is typically not a strong force in the case of professionals, at least not organizational ideology (professional ideology—belief in the profession and its norms—certainly is). All of this means that the professional operator relies on the System of Expertise as the prime means of influence. (p. 132)

Therefore, insofar as training contributes to the knowledge and expertise of these workers it also contributes to their individual (and particularly collective) power.

More recently (and in specific relation to the type of case organization and knowledge workers considered in the present study), Moad (1998) traced and summarized the historical rise of corporate power among such workers. This author traced the power beginnings of this group back to 1950s. He noted that from 1950 to 1960 traditional business executives held strong power because they controlled all information technology within the firm. Moad observed that power among IT professionals increased most rapidly in the period from 1960 through 1980 and this rise coincided with rapid technological changes also occurring during this period. He goes on to note that from 1980 to 1990 in the US the political climate of "Reaganomics" served to return some power to traditional administrative and managerial functions, but beyond this the most recent developments have seen the power of the knowledge worker expand at unprecedented rates. According to Moad (p. 4) "In some highly technology-dependent companies, IT managers aren't just being pulled closer to the business they're starting to take it over."

Such observations of knowledge worker power are particularly useful in the present study because these help to explain the close proximity of perceptions found between the line management training program sponsors, and the knowledge worker training participants in the phase 3 results described. In addition to the organizational co-location of these two groups, there is also an obvious organizational power balance (see also Bunker, 1978 above) between these two groups. Managerial authority on the one hand, expert power on the other. But in connection with his view of post-capitalist society as both a knowledge society and a society of organizations Drucker (1993) sees these as opposite, balancing poles rather than contradictions. This is because most

educated people practice their knowledge as members of an organization and must therefore simultaneously live and work in two cultures—that of the "intellectual," who focuses on words and ideas, and that of the "manager" who focuses on people and work. Intellectuals view the organization as a tool to enable them to practice their profession. Managers see knowledge as a means to the end of organizational performance. According to Drucker (p. 215) both need each other equally:

> If one overbalances the other, there is only non-performance and all-around frustration. The intellectual's world, unless counterbalanced by the manager, becomes one in which everybody "does his own thing" but nobody achieves anything. The manager's world, unless counterbalanced by the intellectual, becomes the stultifying bureaucracy of the "Organization Man." But if the two balance each other, there can be creativity and order, fulfillment and mission.

Although the variation revealed among them can be viewed from a number of theoretical perspectives as discussed thus far, perhaps the realization of Drucker's comments above helps to further explain the similarities in views of training results displayed by all stakeholder groups in the present study. The overall limitations of the study are discussed next.

Limitations of the Study Overall

Beyond the limitations described in connection with each individual research phase, the discussion thus far has suggested several limitations of the study overall. First, although the empirical approach taken has addressed the research questions in describing the nature of stakeholder variation views of training and its evaluation, the study population did not include the perspectives of the most powerful individuals within the

organization hierarchy (such as the CEO and board)[19]. This limitation, however, has also been levied upon organizational studies in general. As noted by Perrow (1992, p. 378) "CEOs and boards of directors need to be studied; these are the elites who exercise the most power." The inclusion of perspectives of such corporate power "elites" could have, perhaps provided a wider range of variation, especially using the interviewing methods discussed in connection with phase 2.

Second, even taken together, the findings of all three research phases represent those of a single case study. As such, it can only be hypothesized that similar (or indeed different) findings would be obtained in another—or set of other—organizational setting(s). Ideally, this research would be repeated across a range of organizations in various sectors including, for example, private, public, profit, non-profit, etc.

Third, while described individually in connection with a range of published research, the empirical methods related here have not been discussed (to my knowledge) in combination within a single study[20]. There are, therefore, no published references with which to compare the integrated results produced. Yet this particular limitation might also be viewed as a positive. For example, defining methodological "triangulation" as the multiple employment of sources of data, observers, methods, or theories in investigations of the same phenomenon, Greene and McClintock (1985) have further described "between-method" triangulation as the use of two or more different methods to measure the same phenomenon. The goal of methodological triangulation is to strengthen the validity of the overall findings through congruence and/or

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[19] It might be noted that at the time of the study there existed six to eight levels of hierarchy between some study participants and the CEO of the organization.

complementarity of the results from each method. Congruence means similarity, consistency, or convergence of results, whereas complementarity refers to one set of results enriching, expanding upon, clarifying, or illustrating the other. Thus the essence of triangulation is that the methods represent independent assessments of the same phenomenon. Yet, as pointed out by Greene and McClintock

> Despite widespread advocacy of mixed-method evaluation designs with triangulation of quantitative and qualitative methods, several major obstacles inhibit their use. First, there is insufficient guidance regarding the implementation of different mixed-methods designs, which leads to confusion about the comparative costs and benefits of design choices (Mark and Shotland, 1984). Similarly, there are too few examples of data analysis in mixed-methods research, either in terms of comparing or integrating results, and even fewer that meaningfully attend to the underlying issue of cross-paradigm triangulation. (p. 524)

Thus the combination and integration of methods used in the present study serve to provide a substantive example of methodological triangulation and integration. The reapplication of these particular methods in connection with a range of further research would, however, provide a most desirable basis for methodological analysis and comparison.

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[20] While data analysis strategies for mixed-method evaluation designs have been described (Caracelli & Greene, 1993) this is concerned with more traditional quantitative and qualitative data forms.

Fourth, rather than produce an itemized list of all possible contextual limitations, it might simply be stated that all empirical data were collected and analyzed by a single researcher (the author), in the case organization described, under the circumstances that prevailed. While Wolcott (1990, p. 30) has referred to such disclaimers as a standardized "litany of limitations" he also pointed out the importance of underscoring "any element deserving of special mention" in a particular study. Fortunately, most elements associated with the organizational context were relatively stable during the period in which data collection occurred. For example, phase 1 data collection commenced in May, and ended in August of 1997. Phase 2 data collection commenced in November and ended in late December of the same year. Phase 3 data collection both commenced and ended in May of 1998. During the whole time period in which all data were collected, both the training program and organization enjoyed a period of relative calm at least relative to training. But this was not to remain the case much past mid-summer of 1998. For it was at that point, after all data had been collected, that major changes were announced affecting training at the corporate level of the organization. Because these changes were only proposed to the functional training groups in the organization, and were not generally known throughout the company at large until well after all data were collected (4^{th} quarter, 1998) they are not viewed as having influenced the (for example, the phase 3 survey) data in any way. In fact, the program studied is still in tact as I write this. Only the way in which the program is administered has been affected. Also, it should be mentioned that the researcher's role within the organization was that of a training specialist during the period in which the data were collected and analyzed.

Fifth, while methods employed for phase 1 and phase 3 were based on approaches that have been well-discussed, the approach taken in phase 2 (interviews) followed a particular approach toward qualitative analysis, namely semistructured interviewing, transcription, coding, and analysis following Miles and Huberman (1994). But many approaches to interview analysis exist within a range of qualitative research paradigms (Guba & Lincoln, 1989; 1994) that are more or less concordant with this semistructured approach (see, e.g., McCracken, 1988; Morrissey, 1995; Psathas, 1995). Although, it was clear that the semistructured interviews did further enrich the overall study, it might be argued that more purely phenomenological or ethnomethodological approaches might have yielded even richer description. Such approaches would have, however, relied more upon grounded theory thus negating the use of the predefined conceptual framework employed. As discussed, this particular approach was chosen within the overall context of the study and research questions, and it is believed to have worked well within this, and the organizational, context of the study.

Chapter 8

Conclusions

The study findings suggest that stakeholder groups varied in the relative emphases and importance they placed upon a similar set of perceived training results. This set of results was characterized by both traditional and emergent indicators and reflected themes and concepts related to customer satisfaction, market competitiveness, product design and development, quality, business results, employee satisfaction (especially in terms of professional and career growth), and productivity through the development of the intellectual capital of the organization.

Evidence was further produced to support the conclusion that stakeholder group perceptions of training evaluation do depend on the results they perceived for training. Variation among the groups was shown to be related to differences in their organizational roles and values. These values were expressed as themes of management among program sponsors; professional, job and career development among participants; and internal client satisfaction related to program sustenance among training providers.

These findings were developed in the last chapter which contains an integrated discussion of the implications of the study particularly in reference to the methodological and conceptual framework employed. The current chapter focuses on the implications of the study specifically in terms of three main areas. These involve (1) continuing research especially related to training evaluation and combining methods, (2) developing theory for training evaluation, and (3) improving training evaluation practice.

Continuing Research

Training evaluation research efforts have generally focused upon isolated aspects using singular empirical methods. Indeed, the lack of literature available for methodological comparison relative to the three-phase approach taken in the present study has been noted as a general limitation of the overall study. But the positive side of this has also been flagged: for how can we expect to advance if we confine ourselves only to repetitive methodological and empirical approaches? The expanded views and complementary insights gained by combining the methods used in this study have provided a range of data to address its research questions. But this methodological combination has also broken new empirical ground. Yet an in-depth inquiry related to technical aspects (e.g., reliability, validity) of the approach taken is well beyond the scope of the present study. For this reason, two distinctive sets of research implications are described. The first is related to training evaluation research. The second is related specifically to the technical aspects of combining the methods employed in the study.

Training Evaluation

Training is related to purposive learning. As described in the present study much training evaluation research has consequently focused upon aspects of training efficiency especially in terms of theories of transfer as related to skill development and observable changes in behavior. But multiple authors have underscored the lack of fit between such behaviorally-oriented approaches and populations of knowledge workers (Brown & Duguid, 1991; Conference Board, Inc., 1997; Lewis, 1996; Orr, 1987, 1990; Pepitone, 1995; Sacks, 1994; Shayo & Olfman, 1993).

These results have strong implications for training evaluation practice. As this practice has only tacitly treated issues related to power and politics by continuing to assume goal and stakeholder homogeneity, training professionals have been traditionally cast as would-be program evaluators internal to both the organization and the program. Might alternative stakeholder-based, participatory (Cousins & Earl, 1992), or internal evaluation (Love, 1991) evaluation modes be prescribed? Why haven't training providers embraced wide-scale usage of evaluation methods, models, and techniques beyond end of course satisfaction measurement? Is the training evaluation function best defined and formalized as an independent position in the organization? Finally, what cross-case generalizations might be developed from a further examination of the interrelationships between the stakeholder groups identified here? These questions are deemed highly relevant and worthy of continued investigation.

Another major area of training evaluation might best be viewed as quasi of even training evaluation "action" research. The purposive action here is mostly on behalf of training professionals seeking to promote, sustain, or market training solutions to organizational clients (Brown, 1994; Moad, 1995). Alternative motives for such evaluation and evaluation research might also include, however, decision or investment justification by decision makers (Darrah, 1995). Both of the main areas summarized above may be seen as related in suggesting the following implications stated as questions to guide future training evaluation and research efforts:

- How do knowledge workers learn best in complex organizations? How much, and what type(s) of, resources and structures are required? Who defines and acts on learning requirements? In what ways?

- What is the complete range of stakeholder variation in training program evaluation? At the work group, departmental, divisional, organizational, and trans-organizationl levels?
- From whose perspective should training be evaluated? What are the core motivations and outputs of evaluation?
- How can specific evaluation approaches (e.g., internal, goal-free, utilization-focused, or participatory) be more effectively employed in connection with training evaluation?
- Can training evaluation ever be meaningfully conceived and performed in a completely apolitical context? If so, under what contextual circumstances? If not, how can the influence of organizational power and politics be made explicit and used in a constructive manner within the evaluation?

Combining Methods

This study employed both qualitative and quantitative methods. Within the scope of the present investigation, these methods (both individually and in combination) have produced different kinds of evidence to answer the research questions posed. The concept mapping and pattern matching employed in phase 1 yielded stakeholder group-level views of training results and evaluation importance. The qualitative interviews in phase 2 further explored and probed these views from the perspective of individual stakeholder group members. The quantitative survey served to extend and generalize two of the three stakeholder group views within the case organization.

While technical issues related to reliability and validity have been discussed in connection with concept mapping and it component procedures (Caracelli, 1989;

Trochim, 1993; Weiss, 1983), qualitative and interview methods (Denzin & Lincoln, 1994), and the quantitative techniques (Campbell, 1983; Cook & Campbell, 1983; Hinkin, 1998; Schmitt & Klimoski, 1991), no such equivalent discussion is known (at least by this author) to exist for these methods in combination. As mentioned, while a detailed investigation of such technical issues is beyond the present scope, several implications are highlighted for future work in this area:

- Can (or should) overarching indicators of technical quality be produced to describe the collective "reliability and validity" of the methods used here in concert? What quantitative and qualitative elements might such indicators include. How would these be defined, weighted, and combined?
- How can the analytical findings produced by each of the methods employed be properly combined? Do (or should) the findings produced by any particular method "outweigh" the findings produced by the other(s).
- How could conflicting findings between the methods be handled?
- While the individual use of each of the three methods may suggest a particular paradigmatic orientation (e.g., positivist, post-positivist, constructivist), what does their combined use suggest ontologically and epistemologically? Are such distinctions important and worthy of consideration?

Also, precisely because of the dearth of literature regarding the combination of methods used I will briefly reflect on my impressions of the relative merits, advantages and disadvantages across the study phases. As summarized in **Table 20** the methods used are compared relative to each other especially in terms of (1) how difficult it was to

implement each, (2) the relative costs, (3) the demands each placed on the participants, and (4) how useful the results were.

Table 20. Comparison of Methods

Method	Implementation Difficulty	Cost	Participant Convenience	Usefulness of Results
Phase 1 Concept Mapping	high -orienting participants on method -face to face meeting -group facilitation skills -hardware & tools setup	moderate -software -meeting -materials	moderate -learning curve -group event -sorting -rating	high -group data -quantitative -qualitative -visual/graphic
Phase 2 Interviewing	moderate -face to face -interviewing skills -recorder setup & monitoring	moderate -software -audio taping -transcribing	moderate to high -easy to schedule -conversational -informal feeling	moderate -qualitative -corroborative -non-verbal
Phase 3 Survey	high -planning & preparation -piloting, proofing, printing -initial promotion & follow-up	high -software -promotion -printing	moderate to high -flexible scheduling -minimal hardware -easy response	moderate -quantitative -corroborative -group size

As a researcher concerned with producing a high-quality study, I found the implementation difficulty moderate to high for all methods. Each method presented a slightly different, but nonetheless, considerable degree of planning and execution challenge. A straightforward way to compare the costs associated with each method is to simply compare the relative costs of the software involved. Major software purchases included The Concept System, QSR-NUD-IST, SPSS, and Teleform. A notable plus is that significant discounts were generally available for student/researcher applications of these products.

All methods were generally convenient for participants. This convenience came at the expense of the researcher's time and convenience, however. As discussed, all methods yielded useful information relative to the study. Because of the way the study

was planned it should be noted that a main purpose of the second phase was to corroborate findings from phase 1 (by asking individuals to comment on the concept map produced by their group). While phase 3 was limited to only two groups (and was subject to the other limitations mentioned) the results of this phase also corroborated well with those of the previous phases.

Developing Theory

Training evaluation "theory" has been dominated by a four-level view in terms of satisfaction, learning, behavior, and results. While this has been, and will probably continue to be, a useful heuristic based on its theoretical economy and intuitive practicality, probably its greatest shortcomings relate to its assumptions of a singular evaluative perspective within a classical/rational organizational setting. From this perspective, the evaluator collects and analyzes data and provides evaluation results to the sponsor of the evaluation. Training participants act mainly as passive data sources, and the model becomes stifled by complexity in its attempts to link and reduce organizational effects and performance to training causes (Sleezer, Hough, & Gradous, 1998). While increasing numbers of authors have begun to suggest alternatives (Brinkerhoff, 1987; Brinkerhoff & Gill, 1994; Hale, 1998; Lewis, 1996; Moitra, 1976) the results of the present research suggest the following questions related to furthering such development:

- Why has training evaluation theory not been integrated (or in many cases even recognized) in organizational theory?
- Why has training evaluation theory not been integrated (or in many cases even recognized) program evaluation theory?

- How can organizational and evaluation theory be integrated to inform the development of training evaluation theory?
- Why hasn't power and political organizational theory been recognized in training evaluation?

Improving Practice

Training evaluation practice has suffered from being at once both too reactive and too proactive. It has been overly reactive in the sense that training professionals with a significant stake in a given internal program all too often have either constructed, or purchased, program evaluation results to justify, sustain, or defend their programs from internal budget cuts. It has been overly proactive in the sense that the training profession at large seems to have adopted training evaluation as a way to market training as a commodity to the management of businesses and organizations. All too often, the commonly pointed to "reason" for training evaluation to improve training receives little more than lip service, especially in schedule and budget environments where the objective is to "deploy" training in a timely and cost-effective manner. Training and evaluation remain largely separate and isolated activities. The following suggestions are offered to improve practice:

- Plan the evaluation into the training from its first inception. Recognize the additional cost in terms of both time and resources required to do so.
- Identify the stakeholders, variables, important criteria, relevant to any given training evaluation effort.

- Identify and make explicit the political and power dimensions associated with training program evaluation. Use such information to learn organizationally and improve the evaluation.
- Recognize and develop expertise related to evaluation among training professionals. Expand university-level programs of study related to training, human performance, and human resources development. Integrate an organizational, administrative, and evaluation components into such programs. Recognize the multidisciplinarity of such programs.
- Utilize a balanced approach to training program evaluation involving aspects of, for example, internal, external, stakeholder-based, and participatory approaches.

Final Conclusions

The investigation undertaken here has produced evidence of stakeholder variation in perceptions of training evaluation in a complex organizational setting of knowledge workers. These variations have been seen to be related to unique value differences among the groups and have further been discussed in terms of their implications for training evaluation practice.

In addition to addressing the research questions, the study has demonstrated that stakeholder expectations of training are, indeed, lofty. Commonly cited perceptions across the groups related to training's ability to affect the critically important organizational results mentioned, are testimony to training's power enhancing capacity for all stakeholders involved. If organizational power derives from the skills of various actors then training that enhances these skills also provides power to those who practice

them. If the continuous development of knowledge and skills are valued by the organization, and its management is convinced of the training group's ability to support this development, then the providers of training also have power. But as "middle-men" in the knowledge, skill, and attitude value-added production and deployment process this power is perceived by trainers to be ephemeral, always requiring renewal lest management's power to curtail the training group's funding be exercised. But what could be more important than achieving operational and strategic results to an organization? The capability to produce "hard evidence" linking training to such results has long been training evaluation's "holy grail." Some would argue that, at least in isolated cases, this hard evidence and linkage has been accomplished. Where it has, training's position is secure (at least temporarily). Evaluation from the training professional's perspective serves multiple purposes of improving program, demonstrating its value, demonstrating professional (training related) expertise, and developing and sustaining internal client satisfaction.

Finally, given these findings and their implications, the particular stakeholders involved in the present study can hardly be faulted for their political tendencies. As mentioned, these are a fact of both organizational and societal life. Rather, they should be commended for being as open with their views and unprotective of their shared feelings as they were. Also, the case organization itself and its management should be commended for its receptiveness (or least tolerance) for the research performed. Indeed, it is precisely this receptiveness that has contributed to both a culture and climate in the organization that freely shares ideas as well as values and fosters continuous learning.

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Appendices

Appendix A. Description of Training Program.

This appendix describes specific organizational training program policy and details. The following pages were excerpted (in text-only format) from the internal World Wide Web (WWW) homepage for the Transmission Training Program. This web reference has become the defacto representation of the training program and its process, procedures, courses, etc. Only changes to delete and [replace] specific personal and organizational names were made.

Appendix A (continued)

Transmission Training Program Overview, Date of Issue: June 03, 1996, Issue Number: 5.00

CONTENTS

ABOUT THIS DOCUMENT

Audience

This document is intended for anyone working in Broadband Networks/Transmission Division 1 or the Radio Systems and Technology group who would like an overview of the Transmission training program.

Purpose

The intent of this document is to introduce the reader to the Transmission training program by giving an overview of the training needs identification process used in Transmission describing the types of records and reports associated with the Transmission Training Program outlining the continuous improvement activities related to the Transmission Training program listing the membership of the Transmission Curriculum Committee (TCC)

How this document is organized

The section called "Training needs identification" outlines how training needs are identified in Transmission at the organizational, project, and individual level.

The section called "Training records and reports" outlines the training records and reports associated with the Transmission Training Program.

The section called "Training evaluation and continuous improvement" describes the activities carried out to evaluate the effectiveness of training in Transmission and to enact improvements.

The section called "Transmission Curriculum Committee" describes the role of the TCC and its membership.

Authority for review and approval

VP, Global Transmission Operations

Appendix A (continued)

TRANSMISSION TRAINING PROGRAM

Training needs identification Training needs identification for Transmission employees is carried out at the organizational, project, and individual levels.

The Transmission organization has been divided into six functional areas: software, hardware, operations, verification, administration, and management. Needs analysis has identified a set of core and extended training related to each group that are captured in relevant "training tracks". Core skills and knowledge are those seen as key development areas for a functional discipline. Extended skill and knowledge refers to areas of more specific development. The tracks and registration procedures can be viewed on-line in WWW http://47.97.96.115:8080/

It is expected that each project develop and maintain a training plan to specify any special training needs, over and above those identified at the organizational and individual level. If a new project needs special skills or people assigned to a project need training that is not already defined as part of their individual training profile then it must be stated in the Project Development Quality Plan and training identified must be undertaken to ensure that employees are adequately qualified to perform their jobs.

Ultimately the most important part of the Transmission training program is the proper identification of the training and development requirements for each individual in the organization. An individual and their manager will assess training requirements based on the core and extended organizational training identified for the employee's functional area, project-specific training, and additional training and career development to meet the specific needs and career goals of the individual. Additional training may include conferences, seminars, university courses, and customer visits. Individual training plans will be completed during the MFA process.

Creating a training plan
Every individual will complete a training plan for the year. The plan outlines the training needs of an individual based on their functional discipline, project assignments, and personal development needs. The training plan is created, maintained, and owned by the individual.

Forms are available in WWW to assist in the creation of individual training plans.

Training summaries
Training summaries for every individual will be maintained by the Training department.
The training summaries list [organization] technical and [LI] training. In addition, external training, conferences, and customer visits are listed in the summaries if reported to the Training department by the individual and/or their manager through the training plan or by sending a cocos to "technical training". The cocos must contain the course name, length of event, vendor (if known), and dates attended.

The training summary is a key document for ISO audits. It is the individual's responsibility to ensure they have an accurate training summary with theirs
and their manager's signature.

Summaries are stored in the EGAD and NT-Train databases for a minimum period of two years. C-level secretaries will be able to generate training summaries at the individual's request.

Appendix A (continued)

Training reports
Training reports will be created and maintained by the Training department. Training reports will track plan/profile submission, training taken, and training planned by C-level department on a monthly basis. Training reports will be distributed to all Transmission senior management.

CONTINUOUS IMPROVEMENT
Training tracks
In order for the organizational training tracks to be an ongoing useful tool for training needs identification, a means for updating must be built into the process. The tracks will undergo reviews triggered by either a predetermined review time, a large scale change in process or technology, or as a result of ongoing evaluation. A yearly review of these tracks will consist of subject matter experts (SMEs) identified by the associated training track prime from each functional group reviewing the tracks in order to validate their content.

In addition, the track will be evaluated on an ongoing basis as a result of regular training evaluations. The evaluations will be collected and reviewed by the Training department. Any large scale change in technology or company direction would, of course, precipitate the need for a more complete review and possibly a new organizational needs analysis.

Training courses
All training is evaluated on an ongoing basis. Evaluations may include post participant evaluations (reaction forms), knowledge and skill acquisition testing, and/ or follow-up surveys for on-the-job application of skills and knowledge.

The Training department is responsible for summarizing and highlighting potential problem areas to instructors, subject matter experts, module owners, and TCC track primes as appropriate. Any actions resulting from these consultations will be negotiated between these groups.

The Transmission Curriculum Committee (TCC)
The TCC is a continuous membership multisite committee set up to define and implement the Transmission training policy (see [principle location] Quality Manual).

TCC membership and Training Track Primes:
[principle location] HR Representative
[principle location] Member
[principle location] Management Track Prime
[principle location] Operations Track Prime
[principle location] H/W Track Prime
[principle location] S/W Track Prime
[principle location] Verification Track Prime
[principle location] Administration Track Prime
Atlanta Member
[principle location] Member (Radio Group Rep)
UK Site Prime
Global Training Prime
Software Training Prime
Verification/Administration Training Prime, Operations/Radio
Hardware/Management Training Prime
TCC Sponsor and Chairperson

Appendix A (continued)

TRAINING POLICY(from #TQS0003)

PURPOSE AND SCOPE
This section describes how staff training needs are identified, addressed and recorded.

ISO 9001 REQUIREMENTS
"Documented procedures shall be established and maintained for identifying the training needs and providing for the training of personnel performing activities affecting quality. Personnel performing specific assigned tasks shall be qualified on the basis of appropriate education, training and/or experience, as required. Appropriate records of training shall be maintained."

RESPONSIBILITIES
The Training Policy shall be owned and maintained jointly by the Training Group and the SONET Transport line groups (refer to Section 1.1.6.4, "Training policy").

The Transmission Curriculum Committee (TCC) oversees this policy and shall be responsible for: recommending policy updates to SONET Transport executives as and when required formulating standards and processes for the Training Program and courses developing training tracks for key functional groups identifying and following up on improvements in the existing Training Program. It is the responsibility of the hiring manager in conjunction with Human Resources to ensure that the qualification for newly-hired employees is assessed and verified for compliance with the requirements of the position.

It is the responsibility of each department manager to ensure that his/her employees receive and maintain adequate training to ensure that they can accomplish their assignments, tasks, and responsibilities to the requirements of the Quality System.

PROCEDURES
Training Tracks are defined to help employees reach maximum effectiveness in their respective job functions and their personal development. These tracks are the basis for developing individually customized training plans that complement informal on-the-job training received from peers and managers. The Training Tracks are divided into core and extended training to help individuals prioritize and do not necessarily represent mandatory training requirements unless explicitly so stated. Project specific training, if applicable, is identified in the Project Development Quality Plan. Responsibility for Training Tracks rests with the Transmission Curriculum Committee.

Training targets will be established and communicated through the MFA Process. Organizational training statistics will be reviewed by senior managers and the TCC on a regular basis. Training in this context includes all relevant external and internal training as well as conferences and visits to customer sites. A training plan is created and maintained by every individual and their manager during the corporate Managing for Achievement (MFA) review process. The manager ensures that training is discussed and planned with the employee.

Individuals and managers use relevant Training Tracks as guidelines for functional training and Project Development Quality Plan(s) for specific development needs. Technical as well as personal development requirements are considered.

Appendix A (continued)

Requests for training are submitted to the appropriate agent ([organization] [principle location] Technical Training, [LI], or external vendors) by the individual via on-line training submissions, E-mail, or telephone.

A training summary for every individual is maintained in the EGAD and [organization]-Training database systems for a minimum of two years. The summaries are accessed using INFOLINK. The summaries contain [LI] and [organization] training history as well as plans for the year as submitted to the Training department by an individual and/or respective managers. A signed off copy of an agreed-to training summary is included as part of the annual MFA process and is the responsibility of each individual.

Training effectiveness is reviewed annually by the TCC, by specific assessment of training tracks and training courses. Changes and additions of tracks and courses are implemented as required. Details of implementation are documented in the "Training Program Overview (TQS4004)."

Appendix A (continued)

PROCESS OVERVIEW

The following list is a simplified view of the training process from an employee's perspective. For more information, click on the associated activity.

Analyze training and development needs
Create and record a training plan
Register with appropriate agents
Obtain and sign training summary
Training evaluation and continuous improvement

ANALYZE NEEDS
for training and development

Ultimately the most important part of the Transmission training program is the proper identification of the training and development requirements for each individual in the organization. A simplified view of the process highlights 3 key steps:

1. Identifying training needs related to functional discipline

Managers and employees assess training needs based on organizational, project specific, and individual requirements.

At the organization level, training guideline have been identified for 6 functional groups (software, hardware, verification, operations, management, and administration).

The tracks have been divided into core and extended knowledge and skill categories. Core skills and knowledge are those seen as key development areas for a functional discipline. Extended skill and knowledge refers to areas of more targeted development dependent on an individual's specific job.

It is important to note that the core and extended categories are not considered mandatory, but are designed to aid individuals in their personal training needs assessment. The relevancy of any particular core or extended category to an individual must be decided upon by the individual and their manager.

Individuals can assess their functional training needs by comparing their current skill and knowledge against the core and extended categories listed. Appropriate training can then be requested from the suggested list or from other internal or external training.

2. Identifying training needs related to projects

In addition to these organizational guidelines, each project in Transmission has a Project Development Quality Plan (PDQP) that list any special training for that project.

Appendix A (continued)

A manager and employee should refer to any relevant PDQPs and make appropriate training plans based on specific project requirements by comparing their current skill and knowledge against any special requirements of the project.

3. Identifying needs beyond functional discipline and project

To complete an individual's training needs assessment, training and development activities beyond those specified in the tracks and PDQPs need to be identified. Each individual should supplement their training plan with appropriate internal and external training, conferences, and customer visits based on their own personal and technical development needs. Several tools exist to help in this endeavor including the on-line indices of training and development activities accessible from the WEB (http://47.97.96.115:8080) and the [parent organization] Learning Institute Development Guide.

CREATE AND RECORD a training plan
Every individual will complete a training plan for the year. The training plan is maintained by every individual and their manager during the corporate Managing for Achievement (MFA) review process.

The plan outlines the training needs of an individual based on their functional discipline, project assignments, and personal development needs.

Training plans can be recorded as part of the MFA, through [e-mail], or any other vehicle agreed to by an individual and the manager. Training Plan Forms have been created to assist individuals in assessing their training and development needs. Training Plan Forms are accessible through ATLAS or the WEB (http://47.97.96.115:8080).

Note:
Employees are NOT required to fill out a Training Plan Form -- they are simply a tool to help you in the process of needs identification.

REGISTERING
[*this section contains details about registering for training along with internal contact information as by e-mail, phone, www url, etc.*]

OBTAIN AND SIGN
a training summary

Once you have registered for identified training with appropriate agents ([organization] Technical Training, [LI], and third party vendors), the next step is to obtain a training summary. The training summary will show an individual's training history at [organization] as well as their plans for the coming year.

The training summary is a key document for ISO audits. It is the individual's responsibility to ensure they have an accurate, signed training summary.

Appendix A (continued)

Training summaries for every individual will be maintained by the Training department. The training summaries list [organization] technical and [LI] training. In addition, external training, conferences, and customer visits are listed in the summaries if reported to the Training department by the individual and/or their manager. Reporting can be done by sending a [e-mail] to "technical training". The [e-mail] must contain the training name, length of event, vendor (if known), and dates attended.

Summaries are stored in the EGAD and NT-Train databases for a minimum period of two years. C-level secretaries are able to generate training summaries at the individual's request.

Individual's can print off copies of their own training summaries using the Transmission Training web page. Managers can print their employees training summaries.

TRAINING EVALUATION and continuous improvement

Training tracks

In order for organizational training tracks to be a useful tool for ongoing training needs identification, a means for updating must be built into the process. The tracks will undergo reviews triggered by either a predetermined review time, a large scale change in process or technology, or as a result of ongoing evaluation.

A yearly review of these tracks will consist of subject matter experts (SMEs) identified by the associated training track prime from each functional group reviewing the tracks in order to validate their content.

In addition, the track will be evaluated on an ongoing basis as a result of regular training evaluations. The evaluations will be collected and reviewed by the Training department. Any large scale change in technology or company direction would, of course, precipitate the need for a more complete review and possibly a new organizational needs analysis.

Training courses

All training is evaluated on an ongoing basis. Evaluations may include post participant evaluations (reaction forms), knowledge and skill acquisition testing, and/ or follow-up surveys for on-the-job application of skills and knowledge.

The Training department is responsible for summarizing and highlighting potential problem areas to instructors, subject matter experts, module owners, and TCC track primes as appropriate. Any actions resulting from these consultations will be negotiated between these groups.

Appendix A (continued)

TRAINING TRACKS

A training track shows the recommended and available training products for individuals performing a particular role. Within Transmission, nine specific roles have been identified -- and their tracks are the result of a comprehensive needs analysis involving subject matter experts and Transmission employees.

The training tracks for 1997 -- including two new tracks -- are listed below. To view what training is recommended for your role, simply click the appropriate category.

Administration	
Hardware	[*see example of course listing*]
Management	[*see example, abbreviated*]
Captive Office	
Computing Support	
Software	[*see example, abbreviated*]
Software Production New track!	
Quality New track!	
Verification	

Appendix A (continued)

HARDWARE DESIGN Issue Date: January 10, 1997

The following tables list the skills and knowledge for hardware personnel. Beside each subject is the suggested training to help you develop in specific areas. To view a course description, click the course title. For self-paced courses, register on the respective course description pages. Courses that have been added to the training track for 1997 as well as brand new courses developed are highlighted with a New! beside them.

CORE SKILLS & KNOWLEDGE

Skill or knowledge area	Available training
[organization] orientation	Entry Leadership Forum ([LI])
	Sexual Harassment Prevention
Design process	Hardware Design Process Overview
	PAS/IEDB Product Change Management
Process	New Hire Orientation
SONET Transport	SONET Transport Business and Products
UNIX	UNIX for Beginners
	UNIX Fundamentals I
	UNIX Fundamentals II
Safety	[principle location] Transport ESD and Fiber Safety
Tools	Introduction to FrameBuilder (Self-paced–UNIX)
	Introduction to FrameBuilder (Self-paced–Mac)

Appendix A (continued)

EXTENDED SKILLS & KNOWLEDGE

Skill or knowledge area	Available training
Quality	Problem Solving and Decision Making
	Excellence! Through Continuous Improvement
Products	[organization] Products Overview
Design and process	Project Management
	Product Configuration Management
	ASIC Design Process
	Optical Fiber Design
	Statistical Analysis Techniques
Telecommunications	Introduction to Telecom Networks
Network planning	S/DMS TN Network Planning (STL)
[organization] environment	PTS/PRS (Problem Resolution System)
	ProSTAR Self-paced tutorial
	TEAM Automated Testing Tool and Language
	ARTIST (Cadence)
	Verilog Synthesis - SYNOPSYS

Appendix A (continued)

SOFTWARE Issue Date: January 10, 1997

The following tables list the skills and knowledge for software personnel. Beside each subject is the suggested training to help you develop in specific areas. To view a course description, click the course title. For self-paced courses, register on the respective course description pages.

Courses that have been added to the training track for 1997 as well as brand new courses developed are highlighted with a New! beside them.

CORE SKILLS & KNOWLEDGE

{This section contain a table of courses for software development personnel similar to the ones displayed in the "hardware track" shown above}

MANAGEMENT Issue date: January 10, 1997

Welcome to the new Transmission Management track! Along with the traditional descriptive and registration information, you'll find several new resources for Transmission managers. The four main areas are

Basic Management Certification: A **listing of recommended courses** that are considered essential training for new managers.

Advanced Management Training: A **listing of recommended courses** to enhance a manager's skills and knowledge.

Lucky Dip: A great place to review and contribute to a database of shared knowledge. Reviews of good books, interesting articles, conferences and useful web sites are featured. Please feel free to add your knowledge and experience!

Manager's Handbook: This web page gives you finger-tip access to human resource information and useful web sites for managers within [organization]. It also includes presentations made by other Transmission Managers for download and use.

Appendix B. Ethics and Concept Mapping Forms.

INVITATION AND LETTER OF INFORMED CONSENT
[DRAFT]

To potential study participant: March 3, 1997

You are invited to participate in a voluntary research and development project being carried out internally in conjunction with The University of Ottawa Faculty of Education and my doctoral (Ph.D.) studies program. The purpose of the study is to investigate stakeholder variation in perceptions about organizational training program evaluation.

The study will be carried out over the next 6 months. If you agree to participate, your participation will consist of constructing a concept map, and *possibly* being interviewed. The construction of a concept map involves three main components requiring approximately 1 to 2 hours each: (1) meeting as a small group for brainstorming short statements in response to a focus statement, (2) individual sorting and rating of these brainstormed statements, and (3) a small group meeting to interpret the resulting concept map. These sessions will be scheduled from March through August of the current year. You *may* also be asked to participate in a one-on-one semi-structured interview session planned for one hour or less. If you are invited to participate in the interview session, a request will be made to audio tape the session.

All information will be treated as strictly CONFIDENTIAL with individual responses being pooled for analysis. You are free to withdraw from the project at any time, before or during an interview, refuse to participate, and refuse to answer questions without penalty. Any information requests or complaints about the ethical conduct of the project may be addressed to the University Human Research Ethics Committee (UHREC) of the Faculty of Education, by calling the Secretary of the Committee, Aline Giroux, at 562-5800 (ext. 4090) in 305 Lamoureux Hall.

The University of Ottawa requires its researchers to obtain formal consent of those participating in research. Your signature at the bottom of this letter would serve such a purpose. If you have any questions, you may contact myself or Professor Brad Cousins using the information below.

Sincerely,

Greg Michalski
[contact information]

Dr. Brad Cousins, Ph. D.
Thesis Supervisor, University of Ottawa, Faculty of Education
P.O. Box 450, Stn. A, Ottawa,
Ontario, K1N 6N5 613-562-5800 (4088)

I agree to participate in the study _____

sign name

_____

print name *date*

Instructions

This packet contains complete instructions and data collection sheets for two key tasks of the concept mapping process:

Task 1 - Sorting the statements into groups and recording your results

Task 2 - Rating the importance and measurability of each individual statement

In your packet you have the following materials:

- this two-page set of instructions
- one set of sort cards
- one Sort Recording form
- two Rating forms (one for importance; one for measurability)

Please follow the instructions below very carefully. Even a few small errors can significantly influence the final results.

Task 1 - Instructions for Sorting and Recording

Step 1 - Sorting the Statement Cards. Enclosed in your package is a **set of cards.** Each card has a statement and a statement ID number. *Group the statements into separate piles in a way that makes sense to you*, following these guidelines:

- Group the statements for how *similar in meaning* they are to one another. Do not group the statements according to how important they are, how high a priority they have, etc. The rating task will ask you how important you believe each idea is.

- There is no right or wrong way to group the statements. You will probably find that you could group the statements in several sensible ways. Pick the arrangement that feels best to you. People differ on how many piles they wind up with. In most cases, anywhere from 10 to 20 piles is fine.

- You cannot put one statement into two piles. Each statement must be put into only one pile. Make sure that every statement is put somewhere. Do not leave any statements out.

- A statement may be put alone as its own pile if you think it is unrelated to the other statements or it stands alone as a unique idea. Do not create any piles that are "miscellaneous" or "junk" piles. If you have statements left over that you can't place, put each statement in its own pile.

Step 2 - Recording the Results. You also have in this packet a **Sort Recording Sheet** for recording the results of your groupings. On that sheet, please write the results of your sorting as described below. An example of how to record a pile is shown in the first box on the Sort Recording Sheet.

- Pick up any one of your piles of statements. It does not matter what order the piles are recorded in.
- Quickly scan the statements in this pile, and write down a *short phrase* or *title* that describes the contents of the pile on the line provided after ***Stack Title or Main Topic*** in the first available box on the Sort Recording Sheet.
- In the space provided under the pile name, write the statement ID number of each card in that pile. Separate the numbers with commas. When you finish with the pile, put it aside so you don't mistakenly record it twice.
- Move on to your next pile and repeat the three steps above, recording the statement numbers in the next available box on the Sort Recording Sheet. Continue in this way until *all your piles have been named and recorded.*
- Your Sort Recording Sheet has room for you to record up to 20 piles or groups of cards. As mentioned above, any number of piles (usually 10 to 20) is fine. If you have more than 20 piles, continue recording your results on a blank sheet of paper and be sure to attach this extra sheet to the one provided.
- ***Please write legibly and clearly.*** Most of the errors that find their way into the program and results are made at this stage and are due to illegibility.

Task 2 - Instructions for Statement Ratings

In Task 2, you will rate the importance of each statement on two separate forms. Each form contains exactly the same set of statements and rating scales. The only difference is that on one form you will rate the *general* importance of the item, and on the other form you will rate the importance of each statement *specifically as a training program evaluation criterion.* Please follow the instructions and complete **all** ratings on **both** forms.

When you are finished, place all materials back into the addressed envelope, seal the envelope, and return it via interoffice mail (to Greg Michalski, *mailstop*). **If you have any questions, please don't hesitate to contact me (*phone number*).**

Thank you for your cooperation.

Sort Recording Sheet

This sheet is to be used for **Task 1, Step 2 - Recording the Results**. Specific directions for recording your sorts are included in the Instructions for Task 1 - Sorting and Recording. Remember that you do not have to have as many piles as there are boxes on this sheet. The 20 spaces provided allow for variability among participants in the way they group the items. The first box (Example Stack) is filled out to serve as a guide for you.

Example Stack Title or Main Topic: **Program Management** *(descriptive phrase)*
Record here the identifying number of each item in this stack, separating the ID numbers with commas.
> *1, 4, 29, 43, 12*

please record your card pile (stack) sortings below

Stack 1 Title or Main Topic: _____
Record here the identifying number of each item in this stack, separating the ID numbers with commas.
>

Stack 2 Title or Main Topic: _____
Record here the identifying number of each item in this stack, separating the ID numbers with commas.
>

Stack 3 Title or Main Topic: _____
Record here the identifying number of each item in this stack, separating the ID numbers with commas.
>

Stack 4 Title or Main Topic: _____
Record here the identifying number of each item in this stack, separating the ID numbers with commas.
>

Stack 5 Title or Main Topic: _____
Record here the identifying number of each item in this stack, separating the ID numbers with commas.
>

Stack 6 Title or Main Topic: _____
Record here the identifying number of each item in this stack, separating the ID numbers with commas.
>

Stack 7 Title or Main Topic: _____
Record here the identifying number of each item in this stack, separating the ID numbers with commas.
>

Stack 8 Title or Main Topic: _____
Record here the identifying number of each item in this stack, separating the ID numbers with commas.
>

Appendix B (continued)

Stack 9 Title or Main Topic: _____
Record here the identifying number of each item in this stack, separating the ID numbers with commas.
>

Stack 10 Title or Main Topic: _____
Record here the identifying number of each item in this stack, separating the ID numbers with commas.
>

Stack 11 Title or Main Topic: _____
Record here the identifying number of each item in this stack, separating the ID numbers with commas.
>

Stack 12 Title or Main Topic: _____
Record here the identifying number of each item in this stack, separating the ID numbers with commas.
>

Stack 13 Title or Main Topic: _____
Record here the identifying number of each item in this stack, separating the ID numbers with commas.
>

Stack 14 Title or Main Topic: _____
Record here the identifying number of each item in this stack, separating the ID numbers with commas.
>

Stack 15 Title or Main Topic: _____
Record here the identifying number of each item in this stack, separating the ID numbers with commas.
>

Stack 16 Title or Main Topic: _____
Record here the identifying number of each item in this stack, separating the ID numbers with commas.
>

Stack 17 Title or Main Topic: _____
Record here the identifying number of each item in this stack, separating the ID numbers with commas.
>

Stack 18 Title or Main Topic: _____
Record here the identifying number of each item in this stack, separating the ID numbers with commas.
>

Stack 19 Title or Main Topic: _____
Record here the identifying number of each item in this stack, separating the ID numbers with commas.
>

Stack 20 Title or Main Topic: _____
Record here the identifying number of each item in this stack, separating the ID numbers with commas.
>

Appendix B (continued)

Importance Rating Form

Instructions

Rate the relative importance of each statement as a ***training program result*** by circling the appropriate rating below: **1=Relatively Unimportant; 2=Somewhat** Important; **3=Moderately** Important; **4=Very** Important; **5=Extremely** Important. You are encouraged to *spread your ratings out using all 5 numbers.* For example, if you believe a given statement is relatively unimportant (1) compared with another that you consider to be extremely important (5), please use the respective rating values of 1 and 5 to rate these. For other statements you will obviously use more central ratings (2, 3, 4), but don't be afraid to also use both extremes (1, 5) as well.

please circle a number					#	*statement*
1	2	3	4	5	1)	increase understanding of current data networking needs and industry directions
1	2	3	4	5	2)	simplify the learning efforts required of newly-promoted managers
1	2	3	4	5	3)	support customer's strategic and operational objectives
1	2	3	4	5	4)	better employee interpersonal and communication skills
1	2	3	4	5	5)	products exceed customer requirements (e.g., features, operability, cost, maintenance ease, quality of service)
1	2	3	4	5	6)	individual learning style(s) are addressed by optimization of learning media
1	2	3	4	5	7)	contribute to employee sense of professional (self) marketability
1	2	3	4	5	8)	training is integrated with university-industry interaction programs
1	2	3	4	5	9)	promote designer understanding of big picture (how their product fits into market)
1	2	3	4	5	10)	decrease maintenance effort/cost of completed software (e.g., decrease calls to helplines)
1	2	3	4	5	11)	training program objectives obtained directly from organizational business objectives
1	2	3	4	5	12)	develop corporate awareness
1	2	3	4	5	13)	improve "effectivity" of teamwork (more effective staff)
1	2	3	4	5	14)	more accurate estimates
1	2	3	4	5	15)	develop the equivalent skills that we would receive if we spent 1 year working for a customer's business
1	2	3	4	5	16)	increase employee confidence
1	2	3	4	5	17)	just-in-time, just-the-right, training needs are addressed
1	2	3	4	5	18)	better ability to understand the drivers and supporting technology of the telecommunication industry
1	2	3	4	5	19)	reinforces linkage of product development processes to [organization] specific processes
1	2	3	4	5	20)	more efficient organization with improved capacity to take on a broader range of activities
1	2	3	4	5	21)	support personal broadening & job enrichment (develops employee interests in future tasks/roles/responsibilities)
1	2	3	4	5	22)	iconic (isolated) training ceases and integrated training begins
1	2	3	4	5	23)	support key performance plan of organization
1	2	3	4	5	24)	improve modular software design methodologies (code structured for modularity)
1	2	3	4	5	25)	prepares staff for development programs not yet launched (anticipatory education)
1	2	3	4	5	26)	enables a more proactive (positive) response to change
1	2	3	4	5	27)	decrease in number of defects per lines of executable code
1	2	3	4	5	28)	sharing of product development knowledge (open exchange of ideas) is fostered
1	2	3	4	5	29)	significant product quality improvements
1	2	3	4	5	30)	ability to meet/anticipate customer requirements (even when the customer doesn't know them)
1	2	3	4	5	31)	reduced cost of operation internally
1	2	3	4	5	32)	stimulates high level of employee interest & motivation to continue learning
1	2	3	4	5	33)	customer satisfaction improves at a higher rate
1	2	3	4	5	34)	employees say "there's so many good courses and so little time" instead of "are there any courses here that I should take?"
1	2	3	4	5	35)	better exposure to customers networks and business plans

Appendix B (continued)

1	2	3	4	5	36)	better support of strategic direction of organization
1	2	3	4	5	37)	build and run networks end to end to permit valued customer propositions
1	2	3	4	5	38)	employee professional/educational credentials (existing expertise) are better recognized
1	2	3	4	5	39)	better hand-off between functions (e.g., h/w designers to board layout; s/w designers to verification)
1	2	3	4	5	40)	improve ability to leverage change in the technology to the best advantage of our company and our customers
1	2	3	4	5	41)	improve "evolvability" of designs
1	2	3	4	5	42)	increase relevant training days per staff
1	2	3	4	5	43)	contribute to line management perception of staff project preparedness
1	2	3	4	5	44)	personal productivity increases
1	2	3	4	5	45)	develop awareness and understanding of new product development process (e.g. IPI--integrated product introduction)
1	2	3	4	5	46)	realize increasingly cost effective training
1	2	3	4	5	47)	better ability to write efficient, high-quality, code
1	2	3	4	5	48)	less time correcting mistakes/fewer recurrent problems (disseminates "lessons learned" knowledge)
1	2	3	4	5	49)	better manager understanding of employee training and the MFA process
1	2	3	4	5	50)	flexibility in sourcing world-class technical training
1	2	3	4	5	51)	faster transition to 90% effectiveness for new managers
1	2	3	4	5	52)	long-term goal setting skills of employees are improved
1	2	3	4	5	53)	create [organization] differentiator "Network Supplier of Choice"
1	2	3	4	5	54)	narrow the gap between how a designer thinks and how our customers think
1	2	3	4	5	55)	foster networking (between employees across departments and divisions)
1	2	3	4	5	56)	allow changes to be made to existing software more easily
1	2	3	4	5	57)	increase organizational learning (captures/redeploys intellectual property)
1	2	3	4	5	58)	increase general telecommunications and computer (h/w, s/w) "literacy" of employees
1	2	3	4	5	59)	employee satisfaction improved
1	2	3	4	5	60)	learners become teachers and mentors to others
1	2	3	4	5	61)	employees have increased control of their training and knowledge resources
1	2	3	4	5	62)	better general understanding of the benefits/application of root cause analysis
1	2	3	4	5	63)	people appreciate business reality, not just their technical specialty
1	2	3	4	5	64)	support our (organizational) approach to work and job design (structuring work for effectiveness)
1	2	3	4	5	65)	facilitates employee job transitions between functions (e.g., s/w, h/w, etc.)
1	2	3	4	5	66)	people appreciate customer's viewpoint, not just their technical specialty
1	2	3	4	5	67)	improve employee understanding of organizational "culture" (how they fit-into organization)
1	2	3	4	5	68)	demonstrates that the company is investing in the employee and his/her career
1	2	3	4	5	69)	obtain "certified" special skills (such as project management or code inspection)
1	2	3	4	5	70)	improve service management skills
1	2	3	4	5	71)	specialty/tactical training is available equally in all locations
1	2	3	4	5	72)	employees look forward to training to learn something new and "neat" (rather than just fulfilling training days)
1	2	3	4	5	73)	makes new people productive as quickly as possible (faster ramp-up, e.g., to 90% efficiency)
1	2	3	4	5	74)	people appreciate product application, not just their technical specialty
1	2	3	4	5	75)	reduced time to market (speed deliverables, reduce design cycle times)
1	2	3	4	5	76)	highlights and contributes to specialized IC (individual contributor) path training requirements
1	2	3	4	5	77)	encourages reuse of information (helps eliminate reinventing the wheel)
1	2	3	4	5	78)	attain training program compliance with standards (e.g., as set by quality councils, ISO, Baldridge, etc.)
1	2	3	4	5	79)	develop high level of general (employee) satisfaction with training program
1	2	3	4	5	80)	improve project planning/management (clarifies project goals)

Appendix B (continued)

1	2	3	4	5	81)	attracts/retains key employees (best & brightest); develops employee loyalty
1	2	3	4	5	82)	relationship between (1) advanced technology (2) platform and (3) product development is made seamless
1	2	3	4	5	83)	employees are well-prepared for new (and future) technology
1	2	3	4	5	84)	develop tool knowledge and proficiency required to perform the job
1	2	3	4	5	85)	builds employee capacity and skill set to execute broader and more complex tasks
1	2	3	4	5	86)	swift/immediate knowledge use (less than 3 months after course)
1	2	3	4	5	87)	reduced burden on mentors for training new arrivals
1	2	3	4	5	88)	foster shared, collaborative, team learning in the organization
1	2	3	4	5	89)	more productive customer interactions (better value of time spent by both designers & customer)
1	2	3	4	5	90)	develop critical/core expertise (essential scarce skills & depth of knowledge
1	2	3	4	5	91)	improve general product knowledge among employees
1	2	3	4	5	92)	more effective management
1	2	3	4	5	93)	all designers know & follow [SONET transport] development processes
1	2	3	4	5	94)	employees get credit/acknowledgment/rewards for their learning achievements
1	2	3	4	5	95)	training as self development (fun) as well as directly making us more productive (useful)
1	2	3	4	5	96)	improve ability to turn product capabilities into value for the customer
1	2	3	4	5	97)	promote usage of in-house expertise (enables less dependency on external expertise)
1	2	3	4	5	98)	provide an increased understanding of roles within a project
1	2	3	4	5	99)	employees perceive that they are receiving the best training available
1	2	3	4	5	100)	integrate training with on-the-job learning (both recognize & support each other)

Appendix B (continued)

Training Program Evaluation Criteria Rating Form

Instructions

Rate the relative importance of each statement specifically ***as a training program evaluation criterion*** (how important is it to hold a training program *directly accountable* for delivering this result) by circling the appropriate rating below: **1=Relatively Unimportant; 2=Somewhat** Important; **3=Moderately** Important; **4=Very** Important; **5=Extremely** Important. You are encouraged to *spread your ratings out using all 5 numbers.* For example, if you believe a given statement is relatively unimportant (1) compared with another that you consider to be extremely important (5), please use the respective rating values of 1 and 5 to rate these. For other statements you will obviously use more central ratings (2, 3, 4), but don't be afraid to also use both extremes (1, 5) as well.

please circle a number					#	*statement*
1	2	3	4	5	1)	increase understanding of current data networking needs and industry directions
1	2	3	4	5	2)	simplify the learning efforts required of newly-promoted managers
1	2	3	4	5	3)	support customer's strategic and operational objectives
1	2	3	4	5	4)	better employee interpersonal and communication skills
1	2	3	4	5	5)	products exceed customer requirements (e.g., features, operability, cost, maintenance ease, quality of service)
1	2	3	4	5	6)	individual learning style(s) are addressed by optimization of learning media
1	2	3	4	5	7)	contribute to employee sense of professional (self) marketability
1	2	3	4	5	8)	training is integrated with university-industry interaction programs
1	2	3	4	5	9)	promote designer understanding of big picture (how their product fits into market)
1	2	3	4	5	10)	decrease maintenance effort/cost of completed software (e.g., decrease calls to helplines)
1	2	3	4	5	11)	training program objectives obtained directly from organizational business objectives
1	2	3	4	5	12)	develop corporate awareness
1	2	3	4	5	13)	improve "effectivity" of teamwork (more effective staff)
1	2	3	4	5	14)	more accurate estimates
1	2	3	4	5	15)	develop the equivalent skills that we would receive if we spent 1 year working for a customer's business
1	2	3	4	5	16)	increase employee confidence
1	2	3	4	5	17)	just-in-time, just-the-right, training needs are addressed
1	2	3	4	5	18)	better ability to understand the drivers and supporting technology of the telecommunication industry
1	2	3	4	5	19)	reinforces linkage of product development processes to [organization] specific processes
1	2	3	4	5	20)	more efficient organization with improved capacity to take on a broader range of activities
1	2	3	4	5	21)	support personal broadening & job enrichment (develops employee interests in future tasks/roles/responsibilities)
1	2	3	4	5	22)	iconic (isolated) training ceases and integrated training begins
1	2	3	4	5	23)	support key performance plan of organization
1	2	3	4	5	24)	improve modular software design methodologies (code structured for modularity)
1	2	3	4	5	25)	prepares staff for development programs not yet launched (anticipatory education)
1	2	3	4	5	26)	enables a more proactive (positive) response to change
1	2	3	4	5	27)	decrease in number of defects per lines of executable code
1	2	3	4	5	28)	sharing of product development knowledge (open exchange of ideas) is fostered
1	2	3	4	5	29)	significant product quality improvements
1	2	3	4	5	30)	ability to meet/anticipate customer requirements (even when the customer doesn't know them)
1	2	3	4	5	31)	reduced cost of operation internally
1	2	3	4	5	32)	stimulates high level of employee interest & motivation to continue learning
1	2	3	4	5	33)	customer satisfaction improves at a higher rate
1	2	3	4	5	34)	employees say "there's so many good courses and so little time" instead of "are there any courses here that I should take?"

Appendix B (continued)

1	2	3	4	5	35)	better exposure to customers networks and business plans
1	2	3	4	5	36)	better support of strategic direction of organization
1	2	3	4	5	37)	build and run networks end to end to permit valued customer propositions
1	2	3	4	5	38)	employee professional/educational credentials (existing expertise) are better recognized
1	2	3	4	5	39)	better hand-off between functions (e.g., h/w designers to board layout; s/w designers to verification)
1	2	3	4	5	40)	improve ability to leverage change in the technology to the best advantage of our company and our customers
1	2	3	4	5	41)	improve "evolvability" of designs
1	2	3	4	5	42)	increase relevant training days per staff
1	2	3	4	5	43)	contribute to line management perception of staff project preparedness
1	2	3	4	5	44)	personal productivity increases
1	2	3	4	5	45)	develop awareness and understanding of new product development process (e.g. IPI--integrated product introduction)
1	2	3	4	5	46)	realize increasingly cost effective training
1	2	3	4	5	47)	better ability to write efficient, high-quality, code
1	2	3	4	5	48)	less time correcting mistakes/fewer recurrent problems (disseminates "lessons learned" knowledge)
1	2	3	4	5	49)	better manager understanding of employee training and the MFA process
1	2	3	4	5	50)	flexibility in sourcing world-class technical training
1	2	3	4	5	51)	faster transition to 90% effectiveness for new managers
1	2	3	4	5	52)	long-term goal setting skills of employees are improved
1	2	3	4	5	53)	create [organization] differentiator "Network Supplier of Choice"
1	2	3	4	5	54)	narrow the gap between how a designer thinks and how our customers think
1	2	3	4	5	55)	foster networking (between employees across departments and divisions)
1	2	3	4	5	56)	allow changes to be made to existing software more easily
1	2	3	4	5	57)	increase organizational learning (captures/redeploys intellectual property)
1	2	3	4	5	58)	increase general telecommunications and computer (h/w, s/w) "literacy" of employees
1	2	3	4	5	59)	employee satisfaction improved
1	2	3	4	5	60)	learners become teachers and mentors to others
1	2	3	4	5	61)	employees have increased control of their training and knowledge resources
1	2	3	4	5	62)	better general understanding of the benefits/application of root cause analysis
1	2	3	4	5	63)	people appreciate business reality, not just their technical specialty
1	2	3	4	5	64)	support our (organizational) approach to work and job design (structuring work for effectiveness)
1	2	3	4	5	65)	facilitates employee job transitions between functions (e.g., s/w, h/w, etc.)
1	2	3	4	5	66)	people appreciate customer's viewpoint, not just their technical specialty
1	2	3	4	5	67)	improve employee understanding of organizational "culture" (how they fit-into organization)
1	2	3	4	5	68)	demonstrates that the company is investing in the employee and his/her career
1	2	3	4	5	69)	obtain "certified" special skills (such as project management or code inspection)
1	2	3	4	5	70)	improve service management skills
1	2	3	4	5	71)	specialty/tactical training is available equally in all locations
1	2	3	4	5	72)	employees look forward to training to learn something new and "neat" (rather than just fulfilling training days)
1	2	3	4	5	73)	makes new people productive as quickly as possible (faster ramp-up, e.g., to 90% efficiency)
1	2	3	4	5	74)	people appreciate product application, not just their technical specialty
1	2	3	4	5	75)	reduced time to market (speed deliverables, reduce design cycle times)
1	2	3	4	5	76)	highlights and contributes to specialized IC (individual contributor) path training requirements
1	2	3	4	5	77)	encourages reuse of information (helps eliminate reinventing the wheel)
1	2	3	4	5	78)	attain training program compliance with standards (e.g., as set by quality councils, ISO, Baldridge, etc.)
1	2	3	4	5	79)	develop high level of general (employee) satisfaction with training program

Appendix B (continued)

1	2	3	4	5	80)	improve project planning/management (clarifies project goals)
1	2	3	4	5	81)	attracts/retains key employees (best & brightest); develops employee loyalty
1	2	3	4	5	82)	relationship between (1) advanced technology (2) platform and (3) product development is made seamless
1	2	3	4	5	83)	employees are well-prepared for new (and future) technology
1	2	3	4	5	84)	develop tool knowledge and proficiency required to perform the job
1	2	3	4	5	85)	builds employee capacity and skill set to execute broader and more complex tasks
1	2	3	4	5	86)	swift/immediate knowledge use (less than 3 months after course)
1	2	3	4	5	87)	reduced burden on mentors for training new arrivals
1	2	3	4	5	88)	foster shared, collaborative, team learning in the organization
1	2	3	4	5	89)	more productive customer interactions (better value of time spent by both designers & customer)
1	2	3	4	5	90)	develop critical/core expertise (essential scarce skills & depth of knowledge
1	2	3	4	5	91)	improve general product knowledge among employees
1	2	3	4	5	92)	more effective management
1	2	3	4	5	93)	all designers know & follow [SONET transport] development processes
1	2	3	4	5	94)	employees get credit/acknowledgment/rewards for their learning achievements
1	2	3	4	5	95)	training as self development (fun) as well as directly making us more productive (useful)
1	2	3	4	5	96)	improve ability to turn product capabilities into value for the customer
1	2	3	4	5	97)	promote usage of in-house expertise (enables less dependency on external expertise)
1	2	3	4	5	98)	provide an increased understanding of roles within a project
1	2	3	4	5	99)	employees perceive that they are receiving the best training available
1	2	3	4	5	100)	integrate training with on-the-job learning (both recognize & support each other)

Appendix C. Interview Guide Used for Phase 2 research

Part 1: Meaning of the Map

Interpretation of Group-Specific Concept Map

Please examine the concept map developed from the _____ group of which you were a member. Pay particular attention to the concepts (clusters) and the relations among them.

1 Recalling the original focus prompt **about training program results that would contribute to the success of [the organization] in the next 12 to 24 months**, this section asks about your *interpretation* of the map?

1.1 How do your interpret the concepts and relations among them?

1.2 Can you discern any particular "regions" or higher-level clusters of concepts? If so, please describe and comment on these.

1.2.1 How would you define them?

1.2.2 How do they relate each other?

1.3 How well does the map represent your own personal views about organizational training program results?

1.4 Please summarize what this map means to you as an individual.

Part 2: Evaluation

Views & Ideas About Training Program Evaluation (TPE)

2 This section seeks your view about the *purposes*, *processes*, and *consequences* of TPE.

2.1 Do you believe the main *purpose* of TPE is to either (A) determine ways to improve an existing training program, or (B) decide the ultimate worth of an existing program (to, for example, produce evidence as to whether the program should be continued or scraped)?

2.2 Who should be involved in the TPE *process*?

2.2.1 What kind of **data** are required?

2.2.1.1 What type(s) of instruments (forms, surveys, etc.) should be used?

2.2.1.2 How should these data be collected?

2.2.1.3 How much data should be collected?

2.2.1.4 How often should the data be collected?

2.2.2 How should the **analysis** of collected data be done?

2.2.2.1 Who should **interpret** the analysis?

2.2.3 How should the evaluation results be **reported**?

2.2.3.1 Who would be the audience(s) of such reports?

2.2.3.1.1 What methods of reporting would make the information most meaningful to these audiences?

2.3 What do you see as the main or ideal *consequences* of the TPE process.

2.3.1 What sorts of change might TPE lead to [instrumental (decision making), conceptual (learning), symbolic]? Why?

Part 3: Stakeholder Variation

Perceived Stakeholder Differences

3 This final section is concerned with obtaining your views about any *differences* you may perceive about TPE between the main stakeholder groups (training providers, training sponsors, training participants).

3.1 Do you believe there are any substantial differences in how these groups view training evaluation? If so, please explain.

3.2 Do you believe any particular group or groups might favor certain types of evaluation data? Why would this be the case?

3.3 Do you believe any group or groups might favor any particular uses of evaluation results (e.g., might one group or another be more concerned with using evaluation to make program improvement decisions)? Why would this be the case?

Appendix D. Code List for Phase 2 Interview Analysis

Start Codes

RESLT: concept map results— individual agreement or disagreement with concept map.

TRAD: traditional organizational effectiveness—evidence of training perceptions related to financial return (return on investment-ROI), profitability, productivity, efficiency, organizational growth.

EMERGNT: emergent concepts of organizational effectiveness—evidence of training perceptions related to employee and customer satisfaction, professional and career growth, organizational learning.

PURPS: purposes of training program evaluation—evidence related to formative and/or summative evaluation purposes.

PROCS: processes of training program evaluation—evidence of stakeholder perceptions of

INVLVMT: involvement in terms of sponsors (SPONSOR), providers (PROVIDER), trainees (TRAINEE)

DATA-C&A: data Collection and Analysis specifically in terms of questionnaire/survey (QUESTARE-SURVEY), interviews (INTERVIEW), focus groups (FOCUS GROUP)

PRES: presentation of evaluation results specifically in terms of audience (AUDIENCE—SPONSOR, PROVIER, TRAINEE), methods (METHOD) as reports (REPORT), group presentation (GROUP PRES)

CONSQS: consequences of evaluation specifically in instrumental (INSTRUM) and conceptual (CONCEP) terms.

VARIATION: evidence of stakeholder variation among the three stakeholder groups (SPONSOR, PROVIDER, TRAINEE).

Added Codes

*SEPIO: training program sponsor perceptions of other involvement in evaluation.

*SEPDO: training program sponsor perceptions other data required for evaluation.

*SEPPMO: training program sponsor perceptions of other methods for evaluation.

*PEPIO: provider perceptions of other involvement in evaluation.

*PEPDO: provider perceptions other data required for evaluation.

*PEPPMO: provider perceptions of other methods for evaluation.

*TEPIO: trainee perceptions of other involvement in evaluation.

*TEPDO: trainee perceptions other data required for evaluation.

*TEPPMO: trainee perceptions of other methods for evaluation.

Pattern Codes

PAT::xEPB: group x perception of balanced or mixed formative and summative evaluation purposes.
PAT::xEPA: group x perception of all stakeholder involvement in evaluation process.

Appendix E. NUD-IST Programming Details for Phase 2 research

Numeric Node Index and Code Definitions

(2)	/SPONSOR
(2 1)	/SPONSOR/MAP/RESLT
(2 1 1)	/SPONSOR/MAP/RESLT/TRAD
(2 1 2)	/SPONSOR/MAP/RESLT/EMERGNT
(2 2)	/SPONSOR/EVALUATION
(2 2 1)	/SPONSOR/EVALUATION/PURPS
(2 2 1 1)	/SPONSOR/EVALUATION/PURPS/FORMTV
(2 2 1 2)	/SPONSOR/EVALUATION/PURPS/SUMMTV
(2 2 1 3)	/SPONSOR/EVALUATION/PURPS/BOTH**
(2 2 2)	/SPONSOR/EVALUATION/PROCS
(2 2 2 1)	/SPONSOR/EVALUATION/PROCS/INVLVMT
(2 2 2 1 1)	/SPONSOR/EVALUATION/PROCS/INVLVMT/SPONSOR
(2 2 2 1 2)	/SPONSOR/EVALUATION/PROCS/INVLVMT/PROVIDER
(2 2 2 1 3)	/SPONSOR/EVALUATION/PROCS/INVLVMT/TRAINEE
(2 2 2 1 4)	/SPONSOR/EVALUATION/PROCS/INVLVMT/OTHER*
(2 2 2 2)	/SPONSOR/EVALUATION/PROCS/DATA-C&A
(2 2 2 2 1)	/SPONSOR/EVALUATION/PROCS/DATA-C&A/QUESTARE-SURVEY
(2 2 2 2 2)	/SPONSOR/EVALUATION/PROCS/DATA-C&A/INTERVIEW
(2 2 2 2 3)	/SPONSOR/EVALUATION/PROCS/DATA-C&A/FOCUS GROUP
(2 2 2 2 4)	/SPONSOR/EVALUATION/PROCS/DATA-C&A/KNOWLEDGE TEST
(2 2 2 2 5)	/SPONSOR/EVALUATION/PROCS/DATA-C&A/OTHER*
(2 2 2 3)	/SPONSOR/EVALUATION/PROCS/PRES
(2 2 2 3 1)	/SPONSOR/EVALUATION/PROCS/PRES/AUDIENCE
(2 2 2 3 1 1)	/SPONSOR/EVALUATION/PROCS/PRES/AUDIENCE/SPONSOR
(2 2 2 3 1 2)	/SPONSOR/EVALUATION/PROCS/PRES/AUDIENCE/PROVIDER
(2 2 2 3 1 3)	/SPONSOR/EVALUATION/PROCS/PRES/AUDIENCE/TRAINEE
(2 2 2 3 2)	/SPONSOR/EVALUATION/PROCS/PRES/METHOD
(2 2 2 3 2 1)	/SPONSOR/EVALUATION/PROCS/PRES/METHOD/REPORT
(2 2 2 3 2 2)	/SPONSOR/EVALUATION/PROCS/PRES/METHOD/GROUP PRES
(2 2 2 3 2 3)	/SPONSOR/EVALUATION/PROCS/PRES/METHOD/OTHER*
(2 2 3)	/SPONSOR/EVALUATION/CONSQS
(2 2 3 1)	/SPONSOR/EVALUATION/CONSQS/INSTRUM
(2 2 3 2)	/SPONSOR/EVALUATION/CONSQS/CONCEP
(2 3)	/SPONSOR/VARIATION
(2 3 1)	/SPONSOR/VARIATION/SPONSOR
(2 3 2)	/SPONSOR/VARIATION/PROVIDER
(2 3 3)	/SPONSOR/VARIATION/TRAINEE

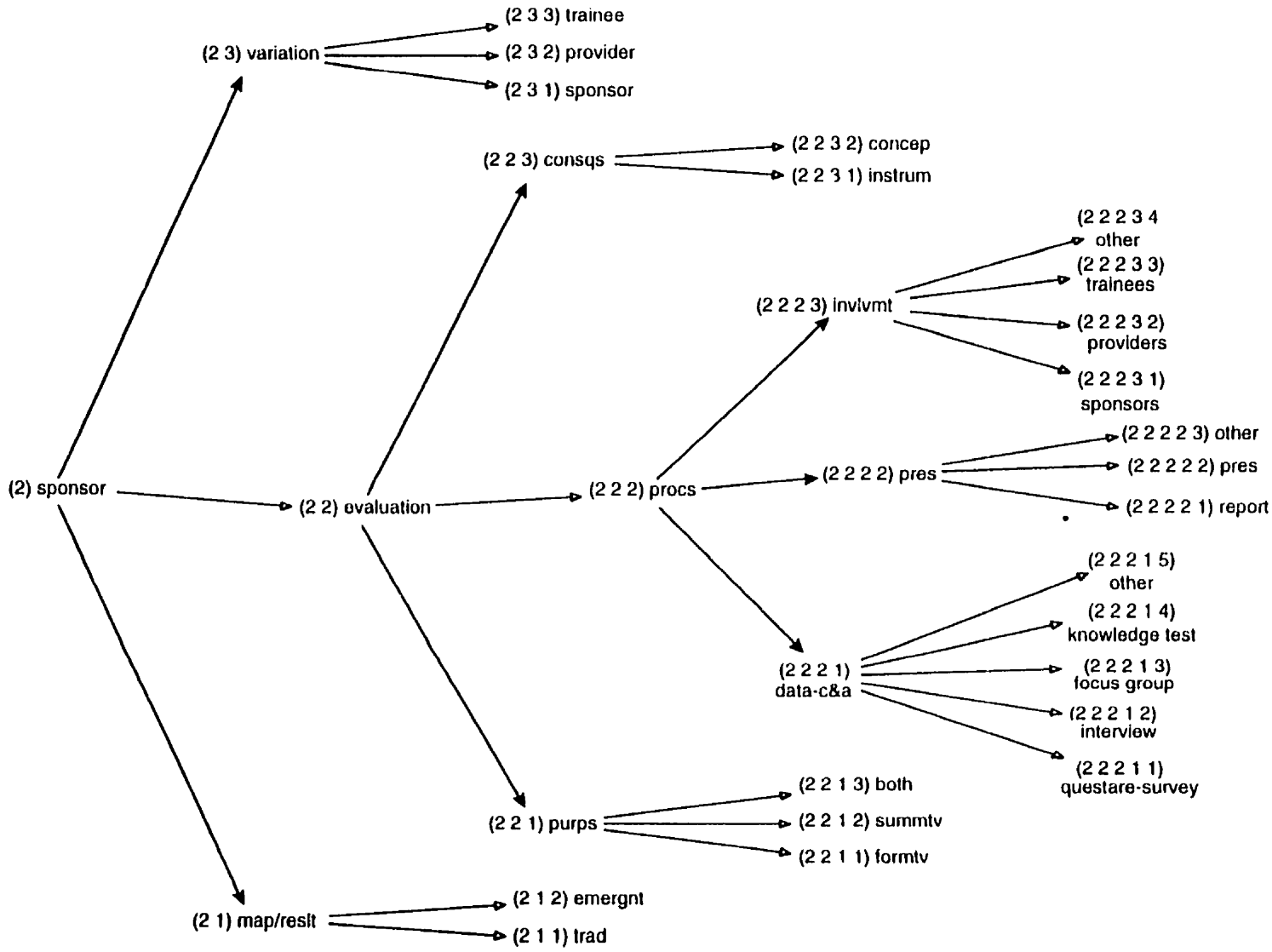
*denotes add-on code developed after initial start codes were defined

**denotes pattern code

Note: Coding example shown for program sponsor branch. Similar coding was used in provider and trainee branches as well.

Appendix E (continued)

Coding Index Tree Structure

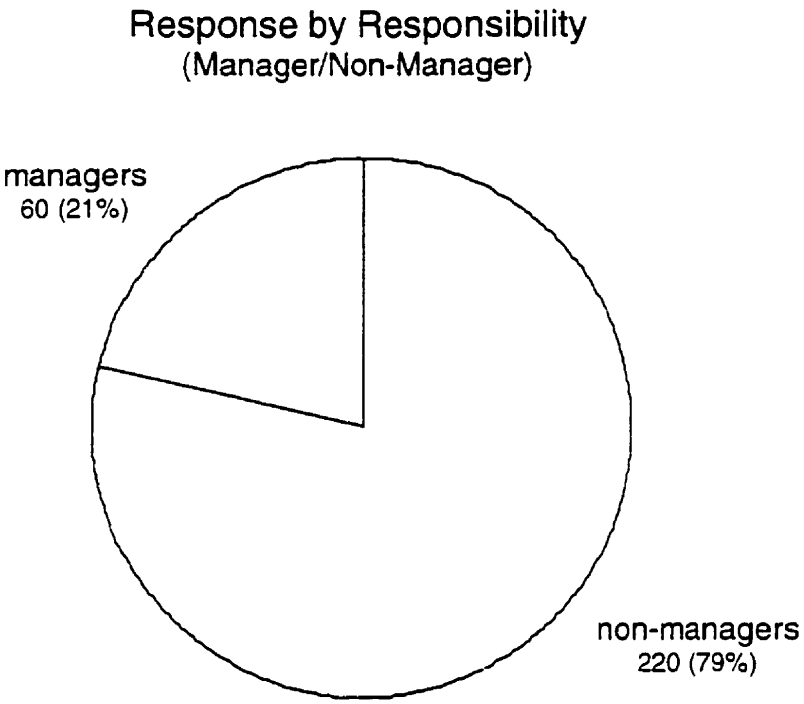


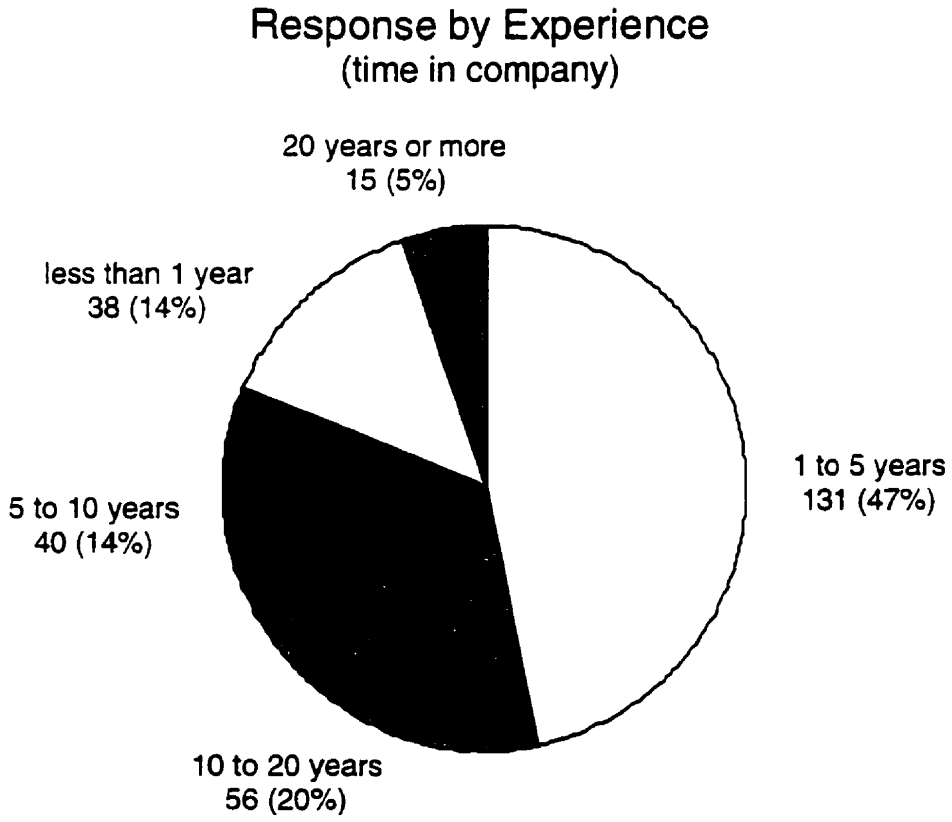
Appendix E (continued)

NUD-IST Command File Used for Index System Generation

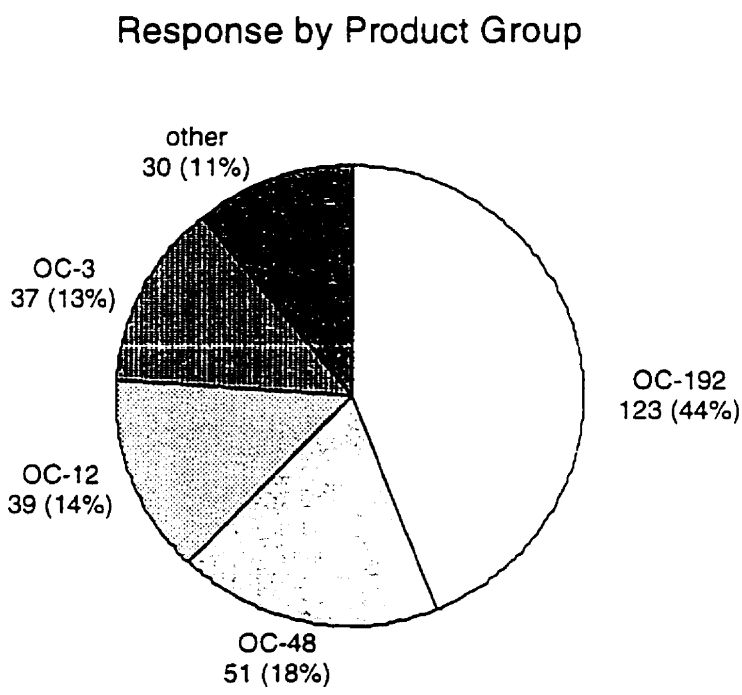
```
(build-tree
        ("map/reslt" ("trad" "emergnt")
        "evaluation" (
                "purps" ("formtv" "summtv" "both")
                "procs" (
                        "data-c&a" ("questare-survey" "interview"
                                "focus group" "knowledge test" "other")
                        "pres" ("audience" ("sponsor" "provider" "trainee")
                                "method" ("report" "group pres" "other"))
                        "invlvmt" ("sponsors" "providers" "trainee" "other"))
                "consqs" ("instrum" "concep"))
        "variation" ("sponsor" "provider" "trainee")
                )
                node (2)
            node-title "sponsor"
        )
(build-tree
        ("map/reslt" ("trad" "emergnt")
        "evaluation" (
                "purps" ("formtv" "summtv" "both")
                "procs" (
                        "data-c&a" ("questare-survey" "interview"
                                "focus group" "knowledge test" "other")
                        "pres" ("audience" ("sponsor" "provider" "trainee")
                                "method" ("report" "group pres" "other"))
                        "invlvmt" ("sponsors" "providers" "trainee" "other"))
                "consqs" ("instrum" "concep"))
        "variation" ("sponsor" "provider" "trainee")
                )
                node (3)
            node-title "provider"
        )
(build-tree
        ("map/reslt" ("trad" "emergnt")
        "evaluation" (
                "purps" ("formtv" "summtv" "both")
                "procs" (
                        "data-c&a" ("questare-survey" "interview"
                                "focus group" "knowledge test" "other")
                        "pres" ("audience" ("sponsor" "provider" "trainee")
                                "method" ("report" "group pres" "other"))
                        "invlvmt" ("sponsors" "providers" "trainee" "other"))
                "consqs" ("instrum" "concep"))
        "variation" ("sponsor" "provider" "trainee")
                )
                node (4)
            node-title "trainee"
)
```

Appendix F. Survey Response Demongraphics.

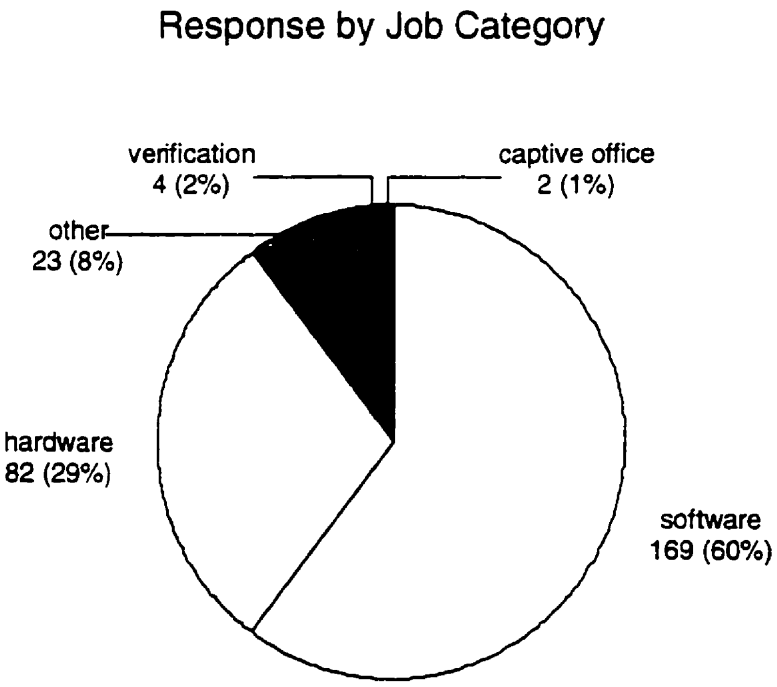




Appendix F (continued)



Note: Product development groups are organized by transmission data capacity. Optical carrier (OC) refers to the fiber optic data transmission. OC-1 is the basic SONET (synchronous optical network) transmission rate of 51.840 Mbits per second. OC-3, 12,..., 192 are multiples of this. OC-192, also referred to as "high-capacity" transport, is capable of transmission rates of 10Gbits per second.



Appendix G. Survey Cover Letter and Instrument

Survey Cover Letter

To: SONET/INM Employees May 6, 1998
Subject: Training Program Evaluation Survey

During the past week you should have received a postcard informing you of the Training Program Evaluation Survey. This survey is enclosed and your cooperation to complete it is appreciated.

We are aware that you are routinely asked to complete various satisfaction surveys, however, this one is substantially different. In addition to gauging your satisfaction with training in SONET/INM, the survey data will also be used to advance knowledge about training evaluation as part of a doctoral (Ph.D.) research project through the University of Ottawa. Greg Michalski, a regular full-time employee with the Advanced Technology Training group, is the doctoral candidate performing this research. Data for this comprehensive case study have been collected for about the last year. To date many of your peers and co-workers have contributed valuable ideas to the project. The survey enclosed represents the culmination of these efforts.

As one of over 400 randomly selected regular full-time employees being asked to participate **your response to this survey is crucial** because your views will serve to represent those of all division 1 employees..

Pilot tests were used both to improve the quality and to minimize the time required to complete the form. Most employees who pilot tested the survey completed it in about 20 minutes. All responses are completely anonymous. Pooled survey results will be made available directly to you through the Transmission Training web site (web url address) after all surveys are returned.

If you have questions about the survey or research project, please contact Greg at (internal extension). This research project has been approved by the Ethics Committee at the Faculty of Education, University of Ottawa, Chair Professor A. Giroux (562-5800 x4066).

Please complete the enclosed survey form and return it using interoffice mail (Training Evaluation Survey, internal mail address) in the envelope provided within **one week** of receipt.

Your participation is greatly appreciated.

Many thanks.

(signed)
Vice President Principle Researcher

Enc. Training Program Evaluation Survey

Appendix G (continued)

Survey Instrument

TRAINING PROGRAM EVALUATION SURVEY (Optical Networks)

This questionnaire has four parts. **Part I** seeks your views on the results of all training (as an integrated *program)* available to you as an employee. **Part II** asks about the evaluation of this training. **Part III** asks you to rate your satisfaction with the Transmission Training program. **Part IV** asks a few (important) employee background questions about you.

Please complete and return the questionnaire in the envelope provided (WDLN-1 Mailroom, Attn: Training Evaluation Survey) within ONE week of receipt. If you have questions, please call ESN 393-3736.

PART I: Training Results

For each of the following statements indicate your view by blackening ONE option:

dark pen or pencil is fi

(SD) Strongly Disagree (D) Disagree (N) Neither Agree nor Disagree (A) Agree (SA) Strongly Agree

Fill circles like this: ●
Not like this: ⊗

		SD	D	N	A	SA
1.1	The main purpose of training should be to improve employee productivity.	○	○	○	○	○
1.2	Effective training ultimately improves business profitability.	○	○	○	○	○
1.3	Product quality can be improved substantially through employee training.	○	○	○	○	○
1.4	The availability of high-quality training leads to increased employee satisfaction.	○	○	○	○	○
1.5	Only job-specific training should be provided to employees.	○	○	○	○	○
1.6	The main purpose of training should be to improve customer satisfaction.	○	○	○	○	○
1.7	Training program objectives should be derived directly from business objectives.	○	○	○	○	○
1.8	The main purpose of training should be to develop employees professionally.	○	○	○	○	○
1.9	Effective training should help designers to anticipate customer requirements.	○	○	○	○	○
1.10	Product time-to-market can be reduced substantially through employee training.	○	○	○	○	○
1.11	All training provided to employees should have a positive "return on investment".	○	○	○	○	○
1.12	Effective training should improve employee understanding of product development processes.	○	○	○	○	○
1.13	Employee promotion and employee training are directly related.	○	○	○	○	○
1.14	Effective training should directly support our customer business objectives.	○	○	○	○	○
1.15	Effective training ultimately improves employee-customer relations.	○	○	○	○	○
1.16	Training is the best way to make new employees productive as quickly as possible.	○	○	○	○	○
1.17	Employee pay and employee training are directly related.	○	○	○	○	○
1.18	Effective training ultimately leads to product innovation.	○	○	○	○	○
1.19	Effective training should result in the immediate use of knowledge on the job.	○	○	○	○	○
1.20	An effective training program attracts or retains the most talented employees.	○	○	○	○	○

Continue on the next page. ⇨⇨⇨⇨⇨

Appendix G (continued)

Part I WRITTEN COMMENTS: Print below any comments you have about training resul

Hint: This field is machine-readable. Neatly printed CAPITAL letters are most easily recognized.

TRAINING RESULTS: An effective training program should result in...

PART II: Training Program Evaluation (TPE)

Part II seeks your views on the evaluation of all training available to employees as an integrated *program* (consisting of all courses, self-paced learning modules, computer-based training).

For each of the following statements indicate your view by blackening ONE option:

(SD) Strongly Disagree	(D) Disagree	(N) Neither Agree nor Disagree	(A) Agree	(SA) Strongly Agree

Fill circles like this: ●
***Not* like this:** ⊗ ∅

		SD	D	N	A	SA
2.1	The main purpose of training program evaluation (TPE) is to improve the program.	○	○	○	○	○
2.2	The main purpose of TPE is to judge whether the program is meeting its objectives.	○	○	○	○	○
2.3	The main purpose of training program evaluation is OTHER (PRINT NEATLY below): ⇨	○	○	○	○	○
2.4	Training specialists should be actively involved in performing the TPE.	○	○	○	○	○
2.5	Trainees (training recipients) should be actively involved in performing the TPE.	○	○	○	○	○
2.6	Training sponsors (line management) should be actively involved in performing the TPE.	○	○	○	○	○
2.7	External evaluation experts should be actively involved in performing the TPE.	○	○	○	○	○
2.8	OTHER individuals/groups who should be actively involved in performing the TPE (PRINT NEATLY below): ⇨	○	○	○	○	○
2.9	Questionnaire data are essential for TPE.	○	○	○	○	○
2.10	Interview data are essential for TPE.	○	○	○	○	○
2.11	Focus group data are essential in TPE.	○	○	○	○	○
2.12	Knowledge test data from training participants are essential in TPE.	○	○	○	○	○

Continue on the next page. ⇨⇨⇨⇨⇨

PART II (cont.): Training Program Evaluation (TPE)

2.13 OTHER data are essential in TPE (PRINT NEATLY below):

⇨

	SD	D	N	A	SA
2.14 TPE results should be reported directly to training specialists.	○	○	○	○	○
2.15 TPE results should be reported directly to trainees (training recipients).	○	○	○	○	○
2.16 TPE results should be reported directly to training sponsors (line management).	○	○	○	○	○
2.17 TPE results should be reported directly to OTHER (PRINT NEATLY below):	○	○	○	○	○
⇨	○	○	○	○	○
2.18 TPE results should be used mainly as a basis for future decisions about the program.	○	○	○	○	○
2.19 TPE results should be used mainly to develop new knowledge about program effects.	○	○	○	○	○
2.20 TPE results should be used mainly to comply with quality standards such as ISO audits.	○	○	○	○	○
2.21 TPE results should be used mainly to routinely monitor program activities.	○	○	○	○	○
2.22 TPE results should be used mainly to determine trainee satisfaction with the program.	○	○	○	○	○
2.23 TPE results should be used mainly to determine manager satisfaction with the program.	○	○	○	○	○
2.24 TPE results should be used mainly to determine whether program goals are met.	○	○	○	○	○
2.25 TPE results should be used mainly to assist trainees in selecting courses.	○	○	○	○	○
2.26 OTHER TPE results (PRINT NEATLY below):	○	○	○	○	○
⇨	○	○	○	○	○

Part II WRITTEN COMMENTS: Print below any comments you have about training program evaluation.

Hint: This field is machine-readable. Neatly printed CAPITAL letters are most easily recognized.

TRAINING EVALUTION: Training program evaluation should (accomplish, involve, result in)..

Continue on the next page. ⇨⇨⇨⇨⇨

Appendix G (continued)

Part III asks you to rate your satisfaction with the *Transmission (Optical Networks) Training Program*. The following statements refer specifically to training offered in the *Transmission Training Program* described at (http://47.97.96.115/Transmission/).

PART III: Transmission Training Program Satisfaction

For each of the following statements indicate your view by blackening ONE option:

(SD) Strongly Disagree	(D) Disagree	(N) Neither Agree nor Disagree	(A) Agree	(SA) Strongly Agree

Fill circles like this: ●
***Not* like this:** ⊠

		SD	D	N	A	SA
3.1	The program offers me adequate training to improve my job performance.	○	○	○	○	○
3.2	The program offers me adequate training to develop in my career.	○	○	○	○	○
3.3	The program offers me adequate personal development training.	○	○	○	○	○
3.4	I consider the training program to be an asset to me as an employee.	○	○	○	○	○
3.5	The time I spend taking training offered in the program is worthwhile to me.	○	○	○	○	○
3.6	The program meets my needs as an employee in SONET/INM.	○	○	○	○	○
3.7	Training offered in the program helps me to understand customer requirements.	○	○	○	○	○
3.8	Training offered in the program helps me to understand product development process	○	○	○	○	○
3.9	The training program contributes to product design quality in SONET/INM.	○	○	○	○	○

4.1 Please indicate your job role (blacken the appropriate circle).

		SD	D	N	A	SA
○ non-manager ○ manager		○	○	○	○	○

4.2 How long have you been working with [the company]?

○ less than 1 year ○ 1 to 5 years ○ 5 to 10 years ○ 10 to 20 years ○ 20 years or more

4.3 Please select the job category that best describes the work you do.

Please PRINT NEATLY in area below:

○ software ○ hardware ○ verification ○ captive office ○ other ⇨ _____

4.4 Please select the product you are most closely associated with.

Please PRINT NEATLY below:

○ OC-3 ○ OC-12 ○ OC-48 ○ OC-192 ○ INM ○ other ⇨⇨⇨ _____

Thank you very much for your participation. Please mail your form back in the envelope provided [Return Address]

Appendix H. Average Training Result and Training Program Evaluation (TPE) Importance of Statements by Stakeholder Group

Statements	Average (M) Statement Importance by Stakeholder Group*					
	Training Providers		Line Sponsors		Participants	
	Result	TPE	Result	TPE	Result	TPE
1. increase understanding of current data networking needs and industry directions	3.38	3.08	4.46	3.62	4.08	3.69
2. simplify the learning efforts required of newly-promoted managers	3.31	3.23	3.54	3.62	2.85	2.31
3. support customer's strategic and operational objectives	4.85	3.15	4.38	3.46	4.08	3.00
4. better employee interpersonal and communication skills	3.77	3.38	3.46	3.31	4.08	3.46
5. products exceed customer requirements (e.g., features, operability, cost, maintenance ease, quality of service)	3.92	3.00	4.23	3.38	3.92	3.38
6. individual learning style(s) are addressed by optimization of learning media	3.77	4.23	2.31	2.69	2.77	3.00
7. contribute to employee sense of professional (self) marketability	3.46	3.62	3.15	3.00	3.54	3.54
8. training is integrated with university-industry interaction programs	2.85	3.23	1.92	1.77	2.85	3.08
9. promote designer understanding of big picture (how their product fits into market)	3.46	3.38	3.69	3.46	4.08	4.00
10. decrease maintenance effort/cost of completed software (e.g., decrease calls to helplines)	3.85	3.15	3.92	3.31	3.85	3.54
11. training program objectives obtained directly from organizational business objectives	4.08	3.85	3.69	3.54	3.15	3.15
12. develop corporate awareness	3.08	2.38	3.31	3.00	3.38	3.23
13. improve "effectivity" of teamwork (more effective staff)	3.69	3.69	4.08	3.31	3.77	3.31
14. more accurate estimates	3.08	2.38	3.92	3.31	3.62	3.46
15. develop the equivalent skills that we would receive if we spent 1 year working for customer's business	3.08	3.38	3.62	3.62	3.23	3.00
16. increase employee confidence	3.08	2.85	3.15	2.92	3.38	2.77
17. just-in-time, just-the-right, training needs are addressed	4.23	4.08	3.62	3.85	3.54	4.00
18. better ability to understand the drivers and supporting technology of the telecommunication industry	3.62	3.38	3.62	3.62	3.69	3.31
19. reinforces linkage of product development processes to "company" specific processes	3.00	3.00	2.46	2.54	3.15	2.69
20. more efficient organization with improved capacity to take on a broader range of activities	3.08	2.54	3.69	3.54	2.92	2.85

Appendix H (continued)

21. support personal broadening & job enrichment (develops employee interests in future tasks/roles/responsibilities)	3.92	3.54	3.62	3.69	3.46	3.23
22. iconic (isolated) training ceases and integrated training begins	3.15	3.54	2.62	2.92	3.15	3.15
23. support key performance plan of organization	3.92	4.23	4.08	3.77	2.77	2.54
24. improve modular software design methodologies (code structured for modularity)	2.92	2.62	3.54	3.46	3.85	3.92
25. prepares staff for development programs not yet launched (anticipatory education)	3.08	3.08	3.31	3.46	3.08	3.38
26. enables a more proactive (positive) response to change	3.62	3.31	3.62	3.15	3.38	2.85
27. decrease in number of defects per lines of executable code	3.54	3.31	4.00	3.38	3.77	3.85
28. sharing of product development knowledge (open exchange of ideas) is fostered	3.77	3.46	3.54	2.92	3.77	3.31
29. significant product quality improvements	4.31	3.38	4.46	3.77	4.31	3.77
30. ability to meet/anticipate customer requirements (even when the customer doesn't know them)	4.23	2.92	4.62	3.46	4.08	3.38
31. reduced cost of operation internally	3.15	2.92	3.46	2.92	3.54	3.00
32. stimulates high level of employee interest & motivation to continue learning	4.00	4.08	3.31	3.38	3.46	3.85
33. customer satisfaction improves at a higher rate	4.15	3.15	4.23	3.46	4.15	3.15
34. employees say "there's so many good courses and so little time" instead of "are there any courses I should take?"	2.62	2.77	2.77	3.62	3.23	3.77
35. better exposure to customers networks and business plans	3.31	2.31	4.31	3.23	3.38	2.69
36. better support of strategic direction of organization	4.31	3.85	3.62	3.62	2.85	2.69
37. build and run networks end to end to permit valued customer propositions	3.15	2.38	4.15	3.15	3.15	2.54
38. employee professional/educational credentials (existing expertise) are better recognized	2.31	3.08	2.77	2.46	3.23	2.62
39. better hand-off between functions (e.g., h/w designers to board layout; s/w designers to verification)	3.77	3.15	3.38	2.69	3.54	3.46
40. improve ability to leverage change in the technology to the best advantage of our company and our customers	4.15	3.46	4.15	3.38	4.00	3.62
41. improve "evolvability" of designs	3.77	2.85	4.00	3.31	4.08	4.00
42. increase relevant training days per staff	2.00	2.85	2.38	2.77	2.62	2.54
43. contribute to line management perception of staff project preparedness	2.38	2.38	2.46	2.15	2.54	2.15

Appendix H (continued)

44. personal productivity increases	3.92	3.23	3.69	3.46	3.69	3.31
45. develop awareness and understanding of new product development process (e.g. IPI--integrated product introduction)	3.69	3.69	2.85	3.00	3.31	2.62
46. realize increasingly cost effective training	3.15	3.69	3.08	3.46	3.00	3.00
47. better ability to write efficient, high-quality, code	4.08	3.62	4.08	3.69	4.00	4.00
48. less time correcting mistakes/fewer recurrent problems (disseminates "lessons learned" knowledge)	4.23	3.38	4.23	3.85	4.23	3.23
49. better manager understanding of employee training and the MFA process	3.23	3.46	3.15	3.46	3.15	2.69
50. flexibility in sourcing world-class technical training	3.38	3.62	2.92	3.46	3.31	3.23
51. faster transition to 90% effectiveness for new managers	3.15	3.46	3.77	3.62	2.69	2.54
52. long-term goal setting skills of employees are improved	3.23	3.23	3.31	3.08	3.23	3.00
53. create "company" differentiator "Network Supplier of Choice"	4.38	2.62	4.62	3.08	3.77	2.69
54. narrow the gap between how a designer thinks and how our customers think	3.77	2.69	4.38	3.62	3.62	3.31
55. foster networking (between employees across departments and divisions)	3.62	3.54	3.62	3.00	3.85	3.23
56. allow changes to be made to existing software more easily	3.46	2.77	3.77	3.54	3.85	3.46
57. increase organizational learning (captures/redeploys intellectual property)	4.08	3.85	4.00	3.38	3.77	3.15
58. increase general telecommunications and computer (h/w, s/w) "literacy" of employees	3.08	3.69	3.23	3.46	3.62	3.85
59. employee satisfaction improved	3.77	2.92	4.08	3.38	3.85	2.69
60. learners become teachers and mentors to others	3.69	3.62	3.08	3.38	3.38	2.92
61. employees have increased control of their training and knowledge resources	3.38	3.15	2.77	2.92	3.15	3.08
62. better general understanding of the benefits/application of root cause analysis	2.77	2.85	3.23	3.08	3.00	2.69
63. people appreciate business reality, not just their technical specialty	2.77	2.85	4.00	3.92	3.31	2.62
64. support our (organizational) approach to work and job design (structuring work for effectiveness)	2.92	2.69	3.15	3.00	2.85	2.54
65. facilitates employee job transitions between functions (e.g., s/w, h/w, etc.)	3.08	3.31	3.15	3.08	2.85	3.08
66. people appreciate customer's viewpoint, not just their technical specialty	3.54	2.85	4.46	3.85	3.46	2.92
67. improve employee understanding of organizational "culture" (how they fit-into organization)	2.92	2.69	3.23	3.31	3.00	3.31
68. demonstrates that the company is investing in the employee and his/her career	3.69	3.77	3.38	3.54	3.23	3.00
69. obtain "certified" special skills (such as project management or code inspection)	2.85	4.15	3.15	3.38	2.77	3.08
70. improve service management skills	3.00	3.54	2.69	2.92	2.85	2.69

Appendix H (continued)

71. specialty/tactical training is available equally in all locations	3.31	4.00	2.46	2.85	2.92	2.85
72. employees look forward to training to learn something new and "neat" (rather than just fulfilling training days)	2.69	3.38	3.08	3.69	3.38	3.31
73. makes new people productive as quickly as possible (faster ramp-up, e.g., to 90% efficiency)	4.38	4.31	4.31	4.08	4.00	4.15
74. people appreciate product application, not just their technical specialty	3.31	3.23	4.08	3.92	3.31	3.00
75. reduced time to market (speed deliverables, reduce design cycle times)	4.62	3.31	4.77	3.69	4.23	4.08
76. highlights and contributes to specialized IC (individual contributor) path training requirements	2.85	2.77	3.08	3.23	3.23	3.00
77. encourages reuse of information (helps eliminate reinventing the wheel)	3.92	3.46	4.08	3.62	4.08	3.62
78. attain training program compliance with standards (e.g., as set by quality councils, ISO, Baldrige, etc.)	2.38	3.23	2.31	2.77	2.54	2.69
79. develop high level of general (employee) satisfaction with training program	3.69	4.00	3.38	3.85	3.54	3.00
80. improve project planning/management (clarifies project goals)	3.31	3.62	4.23	3.85	3.92	3.38
81. attracts/retains key employees (best & brightest) ; develops employee loyalty	4.08	3.31	4.46	3.54	4.46	2.77
82. relationship between (1) advanced technology (2) platform and (3) product development is made seamless	3.31	2.92	3.15	2.23	3.38	2.69
83. employees are well-prepared for new (and future) technology	3.92	4.15	4.00	4.00	3.77	3.54
84. develop tool knowledge and proficiency required to perform the job	4.00	4.77	3.54	3.77	3.54	3.69
85. builds employee capacity and skill set to execute broader and more complex tasks	4.00	4.46	3.85	3.85	3.46	3.31
86. swift/immediate knowledge use (less than 3 months after course)	3.46	4.54	3.77	3.69	3.31	2.92
87. reduced burden on mentors for training new arrivals	2.38	3.15	2.92	3.15	3.23	3.15
88. foster shared, collaborative, team learning in the organization	3.85	3.62	3.46	3.31	3.54	3.31
89. more productive customer interactions (better value of time spent by both designers & customer)	3.62	2.54	4.23	3.15	3.69	2.77
90. develop critical/core expertise (essential scarce skills & depth of knowledge	4.15	4.54	4.23	4.00	3.62	3.69
91. improve general product knowledge among employees	3.00	3.77	3.46	3.54	3.38	3.62
92. more effective management	3.46	3.08	3.85	3.38	3.92	3.31
93. all designers know & follow [organizational] development processes	3.00	3.62	3.08	2.77	3.54	3.23
94. employees get credit/acknowledgment/rewards for their learning achievements	3.31	3.15	2.62	3.23	2.69	1.85

Appendix H (continued)

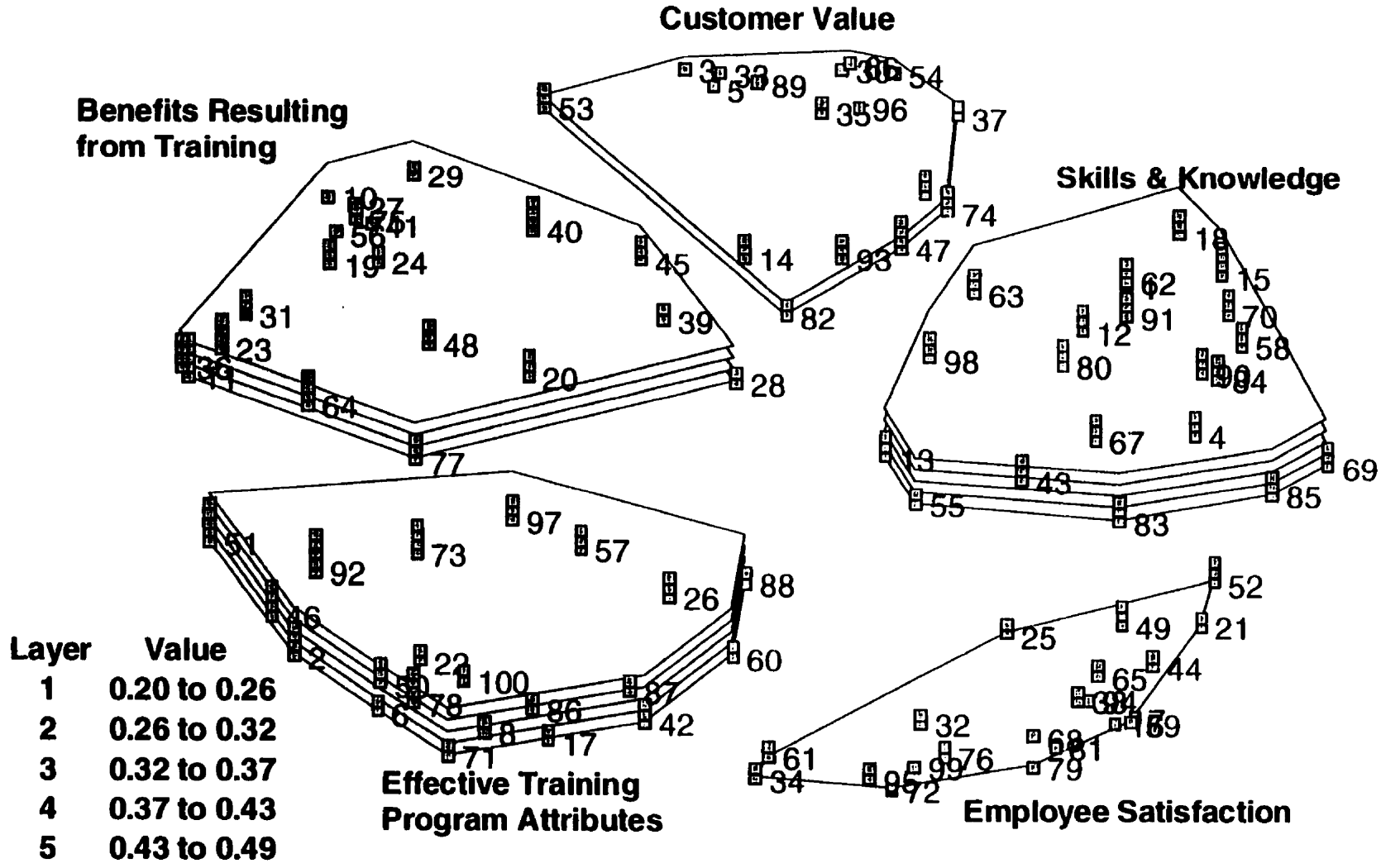
95. training as self development (fun) as well as directly making us more productive (useful)	3.08	3.54	3.08	3.23	2.92	2.77
96. improve ability to turn product capabilities into value for the customer	3.85	3.38	4.46	3.38	3.62	2.85
97. promote usage of in-house expertise (enables less dependency on external expertise)	3.38	3.23	3.00	2.54	2.85	3.08
98. provide an increased understanding of roles within a project	2.69	2.38	3.00	2.62	3.31	2.38
99. employees perceive that they are receiving the best training available	3.62	4.00	3.54	3.85	3.08	3.23
100.integrate training with on-the-job learning (both recognize & support each other)	4.08	4.31	3.38	3.92	3.62	3.77

Note. Each statement rated for importance as a general training program result (Gen.), and as a training program evaluation (TPE) criteria. Scale 1=Relatively Unimportant; 2=Somewhat Important; 3=Moderately Important; 4=Very Important; 5=Extremely Important

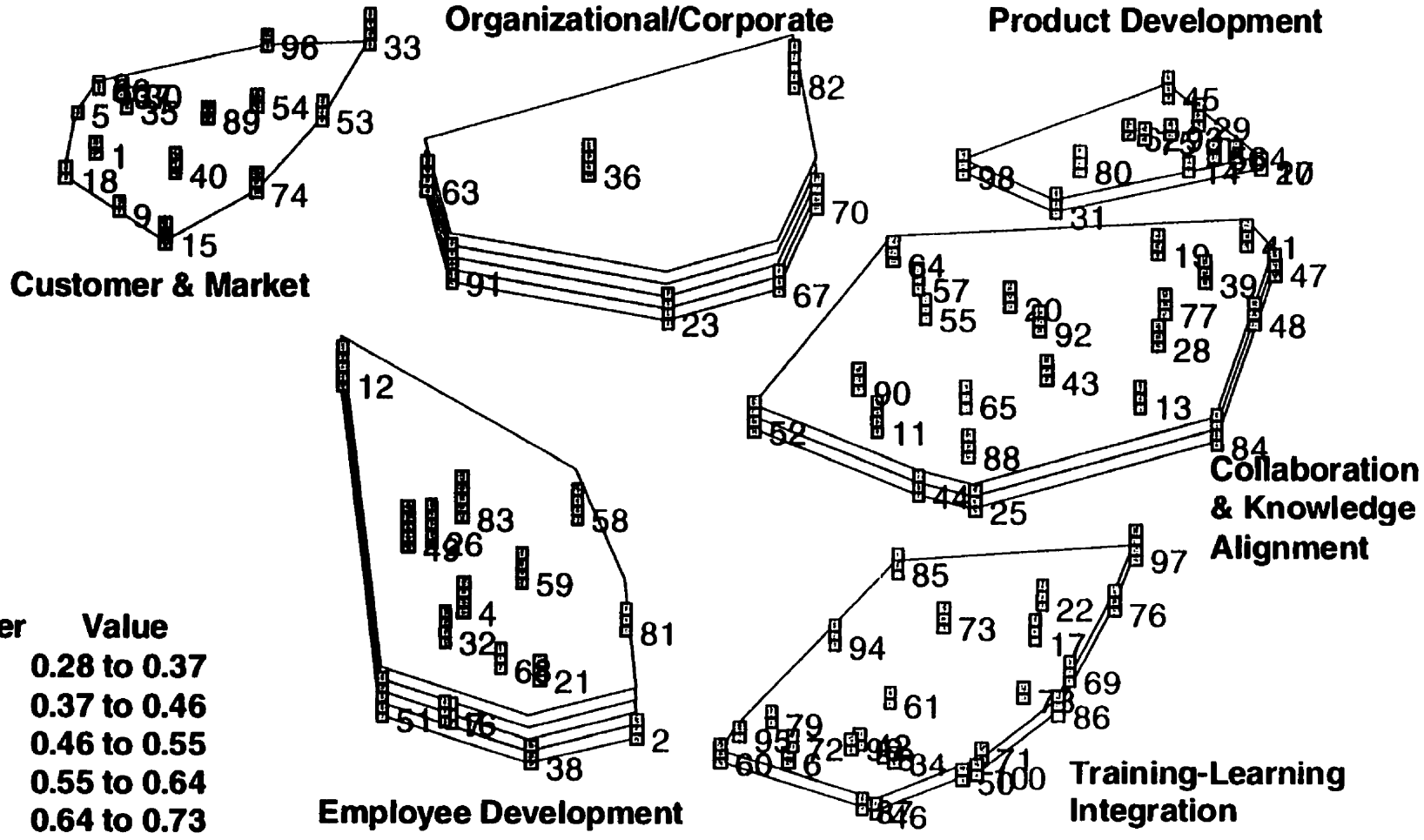
[a] n=13 for each group.

Appendix I. Concept Map Bridging Maps and Data by Stakeholder Group

Training Provider Bridging Map (individual statement values follow) **stress=.3045 in 12 iterations**
Map Bridging Average = .38

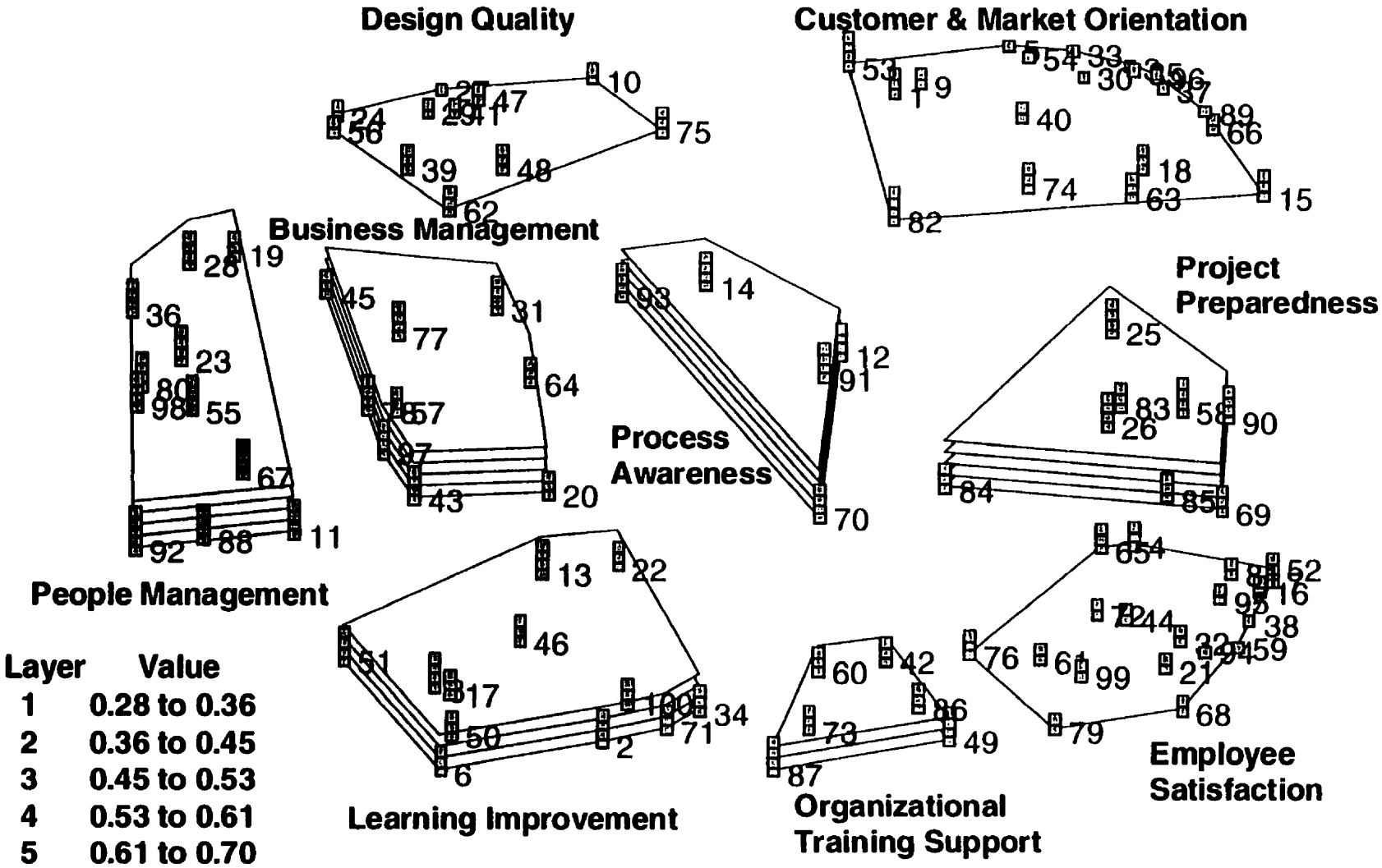


Appendix I (continued)
Line Sponsor Bridging Map (individual statement values follow) **stress=..2474 in 11 iterations**
Map Bridging Average = .50



Layer	Value
1	0.28 to 0.37
2	0.37 to 0.46
3	0.46 to 0.55
4	0.55 to 0.64
5	0.64 to 0.73

Appendix I (continued)
Trainee Bridging Map (individual statement values follow) **stress=..2882 in 12 iterations**
Map Bridging Average = .51



Appendix I (continued)
Training Provider Group Cluster and Statement Bridging Index Values

Cluster 1: Skills & Knowledge (cluster average = .48)

	Statement	Bridging Index
1)	increase understanding of current data networking needs and industry directions	0.41
4)	better employee interpersonal and communication skills	0.43
12)	develop corporate awareness	0.48
13)	improve "effectivity" of teamwork (more effective staff)	0.49
15)	develop the equivalent skills that we would receive if we spent 1 year working for a customer's business	0.65
18)	better ability to understand the drivers and supporting technology of the telecommunication industry	0.49
43)	contribute to line management perception of staff project preparedness	0.53
55)	foster networking (between employees across departments and divisions)	0.39
58)	increase general telecommunications and computer (h/w, s/w) "literacy" of employees	0.42
62)	better general understanding of the benefits/application of root cause analysis	0.52
63)	people appreciate business reality, not just their technical specialty	0.43
67)	improve employee understanding of organizational "culture" (how they fit-into organization)	0.52
69)	obtain "certified" special skills (such as project management or code inspection)	0.54
70)	improve service management skills	0.41
80)	improve project planning/management (clarifies project goals)	0.47
83)	employees are well-prepared for new (and future) technology	0.54
84)	develop tool knowledge and proficiency required to perform the job	0.47
85)	builds employee capacity and skill set to execute broader and more complex tasks	0.53
90)	develop critical/core expertise (essential scarce skills & depth of knowledge	0.48
91)	improve general product knowledge among employees	0.40
98)	provide an increased understanding of roles within a project	0.42

Appendix I (continued)
Training Provider Bridging

Cluster 2: Employee Satisfaction (cluster average = .21)

	Statement	Bridging Index
7)	contribute to employee sense of professional (self) marketability	0.03
16)	increase employee confidence	0.07
21)	support personal broadening & job enrichment (develops employee interests in future tasks/roles/responsibilities)	0.28
25)	prepares staff for development programs not yet launched (anticipatory education)	0.39
32)	stimulates high level of employee interest & motivation to continue learning	0.21
34)	employees say "there's so many good courses and so little time" instead of "are there any courses here that I should take?"	0.32
38)	employee professional/educational credentials (existing expertise) are better recognized	0.26
44)	personal productivity increases	0.36
49)	better manager understanding of employee training and the MFA process	0.54
52)	long-term goal setting skills of employees are improved	0.41
59)	employee satisfaction improved	0.04
61)	employees have increased control of their training and knowledge resources	0.35
65)	facilitates employee job transitions between functions (e.g., s/w, h/w, etc.)	0.20
68)	demonstrates that the company is investing in the employee and his/her career	0.11
72)	employees look forward to training to learn something new and "neat" (rather than just fulfilling training days)	0.13
76)	highlights and contributes to specialized IC (individual contributor) path training requirements	0.26
79)	develop high level of general (employee) satisfaction with training program	0.03
81)	attracts/retains key employees (best & brightest); develops employee loyalty	0.04
94)	employees get credit/acknowledgment/rewards for their learning achievements	0.14
95)	training as self development (fun) as well as directly making us more productive (useful)	0.21
99)	employees perceive that they are receiving the best training available	0.13

Appendix I (continued)
Training Provider Bridging

Cluster 3: Effective Training Program Attributes (cluster average = .50)

	Statement	Bridging Index
2)	simplify the learning efforts required of newly-promoted managers	0.65
6)	individual learning style(s) are addressed by optimization of learning media	0.33
8)	training is integrated with university-industry interaction programs	0.38
17)	just-in-time, just-the-right, training needs are addressed	0.29
22)	iconic (isolated) training ceases and integrated training begins	0.36
26)	enables a more proactive (positive) response to change	0.58
42)	increase relevant training days per staff	0.50
46)	realize increasingly cost effective training	0.74
50)	flexibility in sourcing world-class technical training	0.56
51)	faster transition to 90% effectiveness for new managers	0.93
57)	increase organizational learning (captures/redeploys intellectual property)	0.45
60)	learners become teachers and mentors to others	0.36
71)	specialty/tactical training is available equally in all locations	0.27
73)	makes new people productive as quickly as possible (faster ramp-up, e.g., to 90% efficiency)	0.67
78)	attain training program compliance with standards (e.g., as set by quality councils, ISO, Baldridge, etc.)	0.63
86)	swift/immediate knowledge use (less than 3 months after course)	0.38
87)	reduced burden on mentors for training new arrivals	0.36
88)	foster shared, collaborative, team learning in the organization	0.35
92)	more effective management	1.00
97)	promote usage of in-house expertise (enables less dependency on external expertise)	0.49
100)	integrate training with on-the-job learning (both recognize & support each other)	0.27

Appendix I (continued)
Training Provider Bridging

Cluster 4: Customer Value (cluster average = .26)

	Statement	Bridging Index
3)	support customer's strategic and operational objectives	0.17
5)	products exceed customer requirements (e.g., features, operability, cost, maintenance ease, quality of service)	0.08
9)	promote designer understanding of big picture (how their product fits into market)	0.46
14)	more accurate estimates	0.47
30)	ability to meet/anticipate customer requirements (even when the customer doesn't know them)	0.05
33)	customer satisfaction improves at a higher rate	0.19
35)	better exposure to customers networks and business plans	0.22
37)	build and run networks end to end to permit valued customer propositions	0.24
47)	better ability to write efficient, high-quality, code	0.61
53)	create [corporation] differentiator "Network Supplier of Choice"	0.50
54)	narrow the gap between how a designer thinks and how our customers think	0.06
66)	people appreciate customer's viewpoint, not just their technical specialty	0.00
74)	people appreciate product application, not just their technical specialty	0.41
82)	relationship between (1) advanced technology (2) platform and (3) product development is made seamless	0.35
89)	more productive customer interactions (better value of time spent by both designers & customer)	0.09
93)	all designers know & follow [SONET transport] development processes	0.42
96)	improve ability to turn product capabilities into value for the customer	0.08

Appendix I (continued)
Training Provider Bridging

Cluster 5: Benefits Resulting from Training (cluster average = .44)

	Statement	Bridging Index
10)	decrease maintenance effort/cost of completed software (e.g., decrease calls to helplines)	0.19
11)	training program objectives obtained directly from organizational business objectives	0.81
19)	reinforces linkage of product development processes to [corporation] specific processes	0.54
20)	more efficient organization with improved capacity to take on a broader range of activities	0.52
23)	support key performance plan of organization	0.61
24)	improve modular software design methodologies (code structured for modularity)	0.21
27)	decrease in number of defects per lines of executable code	0.16
28)	sharing of product development knowledge (open exchange of ideas) is fostered	0.36
29)	significant product quality improvements	0.22
31)	reduced cost of operation internally	0.47
36)	better support of strategic direction of organization	0.78
39)	better hand-off between functions (e.g., h/w designers to board layout; s/w designers to verification)	0.38
40)	improve ability to leverage change in the technology to the best advantage of our company and our customers	0.69
41)	improve "evolvability" of designs	0.15
45)	develop awareness and understanding of new product development process (e.g. IPI--integrated product introduction)	0.55
48)	less time correcting mistakes/fewer recurrent problems (disseminates "lessons learned" knowledge)	0.51
56)	allow changes to be made to existing software more easily	0.16
64)	support our (organizational) approach to work and job design (structuring work for effectiveness)	0.63
75)	reduced time to market (speed deliverables, reduce design cycle times)	0.38
77)	encourages reuse of information (helps eliminate reinventing the wheel)	0.51

Appendix I (continued)
Line Sponsors Bridging

Cluster 1: Customer & Market (cluster average = .28)

	Statement	Bridging Index
1)	increase understanding of current data networking needs and industry directions	0.23
3)	support customer's strategic and operational objectives	0.03
5)	products exceed customer requirements (e.g., features, operability, cost, maintenance ease, quality of service)	0.19
9)	promote designer understanding of big picture (how their product fits into market)	0.39
15)	develop the equivalent skills that we would receive if we spent 1 year working for a customer's business	0.57
18)	better ability to understand the drivers and supporting technology of the telecommunication industry	0.26
30)	ability to meet/anticipate customer requirements (even when the customer doesn't know them)	0.02
33)	customer satisfaction improves at a higher rate	0.65
35)	better exposure to customers networks and business plans	0.05
37)	build and run networks end to end to permit valued customer propositions	0.01
40)	improve ability to leverage change in the technology to the best advantage of our company and our customers	0.46
53)	create [corporation] differentiator "Network Supplier of Choice"	0.50
54)	narrow the gap between how a designer thinks and how our customers think	0.33
66)	people appreciate customer's viewpoint, not just their technical specialty	0.00
74)	people appreciate product application, not just their technical specialty	0.54
89)	more productive customer interactions (better value of time spent by both designers & customer)	0.24
96)	improve ability to turn product capabilities into value for the customer	0.33

Appendix I (continued)
Line Sponsors Bridging

Cluster 2: Product Development (cluster average = .40)

	Statement	Bridging Index
10)	decrease maintenance effort/cost of completed software (e.g., decrease calls to helplines)	0.36
14)	more accurate estimates	0.38
24)	improve modular software design methodologies (code structured for modularity)	0.33
27)	decrease in number of defects per lines of executable code	0.36
29)	significant product quality improvements	0.41
31)	reduced cost of operation internally	0.49
45)	develop awareness and understanding of new product development process (e.g. IPI--integrated product introduction)	0.40
56)	allow changes to be made to existing software more easily	0.34
62)	better general understanding of the benefits/application of root cause analysis	0.40
75)	reduced time to market (speed deliverables, reduce design cycle times)	0.39
80)	improve project planning/management (clarifies project goals)	0.45
93)	all designers know & follow [SONET transport] development processes	0.38
98)	provide an increased understanding of roles within a project	0.49

Appendix I (continued)
Line Sponsors Bridging

Cluster 3: Collaboration & Knowledge Alignment (cluster average = .53)

	Statement	Bridging Index
11)	training program objectives obtained directly from organizational business objectives	0.62
13)	improve "effectivity" of teamwork (more effective staff)	0.57
19)	reinforces linkage of product development processes to [corporation] specific processes	0.46
20)	more efficient organization with improved capacity to take on a broader range of activities	0.51
25)	prepares staff for development programs not yet launched (anticipatory education)	0.58
28)	sharing of product development knowledge (open exchange of ideas) is fostered	0.50
39)	better hand-off between functions (e.g., h/w designers to board layout; s/w designers to verification)	0.48
41)	improve "evolvability" of designs	0.46
43)	contribute to line management perception of staff project preparedness	0.52
44)	personal productivity increases	0.57
47)	better ability to write efficient, high-quality, code	0.51
48)	less time correcting mistakes/fewer recurrent problems (disseminates "lessons learned" knowledge)	0.58
52)	long-term goal setting skills of employees are improved	0.61
55)	foster networking (between employees across departments and divisions)	0.46
57)	increase organizational learning (captures/redeploys intellectual property)	0.47
64)	support our (organizational) approach to work and job design (structuring work for effectiveness)	0.50
65)	facilitates employee job transitions between functions (e.g., s/w, h/w, etc.)	0.52
77)	encourages reuse of information (helps eliminate reinventing the wheel)	0.48
84)	develop tool knowledge and proficiency required to perform the job	0.68
88)	foster shared, collaborative, team learning in the organization	0.53
90)	develop critical/core expertise (essential scarce skills & depth of knowledge	0.56
92)	more effective management	0.52

Appendix I (continued)
Line Sponsors Bridging

Cluster 4: Organizational/Corporate (cluster average = .73)

	Statement	Bridging Index
23)	support key performance plan of organization	0.67
36)	better support of strategic direction of organization	0.71
63)	people appreciate business reality, not just their technical specialty	0.71
67)	improve employee understanding of organizational "culture" (how they fit-into organization)	0.54
70)	improve service management skills	0.76
82)	relationship between (1) advanced technology (2) platform and (3) product development is made seamless	0.83
91)	improve general product knowledge among employees	0.90

Cluster 5: Employee Development (cluster average = .67)

	Statement	Bridging Index
2)	simplify the learning efforts required of newly-promoted managers	0.50
4)	better employee interpersonal and communication skills	0.67
7)	contribute to employee sense of professional (self) marketability	0.51
12)	develop corporate awareness	0.91
16)	increase employee confidence	0.53
21)	support personal broadening & job enrichment (develops employee interests in future tasks/roles/responsibilities)	0.46
26)	enables a more proactive (positive) response to change	0.82
32)	stimulates high level of employee interest & motivation to continue learning	0.63
38)	employee professional/educational credentials (existing expertise) are better recognized	0.47
49)	better manager understanding of employee training and the MFA process	1.00
51)	faster transition to 90% effectiveness for new managers	0.89
58)	increase general telecommunications and computer (h/w, s/w) "literacy" of employees	0.79
59)	employee satisfaction improved	0.67
68)	demonstrates that the company is investing in the employee and his/her career	0.49
81)	attracts/retains key employees (best & brightest); develops employee loyalty	0.53
83)	employees are well-prepared for new (and future) technology	0.81

Appendix I (continued)
Line Sponsors Bridging

Cluster 6: Training-Learning Integration (cluster average = .39)

	Statement	Bridging Index
6)	individual learning style(s) are addressed by optimization of learning media	0.32
8)	training is integrated with university-industry interaction programs	0.27
17)	just-in-time, just-the-right, training needs are addressed	0.44
22)	iconic (isolated) training ceases and integrated training begins	0.51
34)	employees say "there's so many good courses and so little time" instead of "are there any courses here that I should take?"	0.25
42)	increase relevant training days per staff	0.24
46)	realize increasingly cost effective training	0.28
50)	flexibility in sourcing world-class technical training	0.32
60)	learners become teachers and mentors to others	0.48
61)	employees have increased control of their training and knowledge resources	0.36
69)	obtain "certified" special skills (such as project management or code inspection)	0.52
71)	specialty/tactical training is available equally in all locations	0.26
72)	employees look forward to training to learn something new and "neat" (rather than just fulfilling training days)	0.29
73)	makes new people productive as quickly as possible (faster ramp-up, e.g., to 90% efficiency)	0.52
76)	highlights and contributes to specialized IC (individual contributor) path training requirements	0.59
78)	attain training program compliance with standards (e.g., as set by quality councils, ISO, Baldridge, etc.)	0.39
79)	develop high level of general (employee) satisfaction with training program	0.37
85)	builds employee capacity and skill set to execute broader and more complex tasks	0.56
86)	swift/immediate knowledge use (less than 3 months after course)	0.46
87)	reduced burden on mentors for training new arrivals	0.32
94)	employees get credit/acknowledgment/rewards for their learning achievements	0.47
95)	training as self development (fun) as well as directly making us more productive (useful)	0.32
97)	promote usage of in-house expertise (enables less dependency on external expertise)	0.62
99)	employees perceive that they are receiving the best training available	0.26
100)	integrate training with on-the-job learning (both recognize & support each other)	0.28

Appendix I (continued)
Participants Bridging

Cluster 1: Customer & Market Orientation (cluster average = .28)

	Statement	Bridging Index
1)	increase understanding of current data networking needs and industry directions	0.44
3)	support customer's strategic and operational objectives	0.00
5)	products exceed customer requirements (e.g., features, operability, cost, maintenance ease, quality of service)	0.15
9)	promote designer understanding of big picture (how their product fits into market)	0.38
15)	develop the equivalent skills that we would receive if we spent 1 year working for a customer's business	0.46
18)	better ability to understand the drivers and supporting technology of the telecommunication industry	0.45
30)	ability to meet/anticipate customer requirements (even when the customer doesn't know them)	0.07
33)	customer satisfaction improves at a higher rate	0.06
35)	better exposure to customers networks and business plans	0.01
37)	build and run networks end to end to permit valued customer propositions	0.05
40)	improve ability to leverage change in the technology to the best advantage of our company and our customers	0.31
53)	create [corporation] differentiator "Network Supplier of Choice"	0.61
54)	narrow the gap between how a designer thinks and how our customers think	0.13
63)	people appreciate business reality, not just their technical specialty	0.49
66)	people appreciate customer's viewpoint, not just their technical specialty	0.24
74)	people appreciate product application, not just their technical specialty	0.59
82)	relationship between (1) advanced technology (2) platform and (3) product development is made seamless	0.66
89)	more productive customer interactions (better value of time spent by both designers & customer)	0.16
96)	improve ability to turn product capabilities into value for the customer	0.04

Appendix I (continued)
Participants Bridging

Cluster 2: Design Quality (cluster average = .33)

	Statement	Bridging Index
10)	decrease maintenance effort/cost of completed software (e.g., decrease calls to helplines)	0.37
24)	improve modular software design methodologies (code structured for modularity)	0.21
27)	decrease in number of defects per lines of executable code	0.19
29)	significant product quality improvements	0.26
39)	better hand-off between functions (e.g., h/w designers to board layout; s/w designers to verification)	0.40
41)	improve "evolvability" of designs	0.24
47)	better ability to write efficient, high-quality, code	0.28
48)	less time correcting mistakes/fewer recurrent problems (disseminates "lessons learned" knowledge)	0.41
56)	allow changes to be made to existing software more easily	0.24
62)	better general understanding of the benefits/application of root cause analysis	0.43
75)	reduced time to market (speed deliverables, reduce design cycle times)	0.57

Cluster 3: People Management (cluster average = .70)

	Statement	Bridging Index
11)	training program objectives obtained directly from organizational business objectives	0.61
19)	reinforces linkage of product development processes to [corporation] specific processes	0.58
23)	support key performance plan of organization	0.64
28)	sharing of product development knowledge (open exchange of ideas) is fostered	0.62
36)	better support of strategic direction of organization	0.67
55)	foster networking (between employees across departments and divisions)	0.67
67)	improve employee understanding of organizational "culture" (how they fit-into organization)	0.75
80)	improve project planning/management (clarifies project goals)	0.75
88)	foster shared, collaborative, team learning in the organization	0.74
92)	more effective management	1.00
98)	provide an increased understanding of roles within a project	0.65

Appendix I (continued)
Participants Bridging

Cluster 4: Business Management (cluster average = .62)

	Statement	Bridging Index
20)	more efficient organization with improved capacity to take on a broader range of activities	0.59
31)	reduced cost of operation internally	0.70
43)	contribute to line management perception of staff project preparedness	0.65
45)	develop awareness and understanding of new product development process (e.g. IPI--integrated product introduction)	0.51
57)	increase organizational learning (captures/redeploys intellectual property)	0.55
64)	support our (organizational) approach to work and job design (structuring work for effectiveness)	0.57
77)	encourages reuse of information (helps eliminate reinventing the wheel)	0.66
78)	attain training program compliance with standards (e.g., as set by quality councils, ISO, Baldridge, etc.)	0.71
97)	promote usage of in-house expertise (enables less dependency on external expertise)	0.61

Cluster 5: Learning Improvement (cluster average = .58)

	Statement	Bridging Index
2)	simplify the learning efforts required of newly-promoted managers	0.63
6)	individual learning style(s) are addressed by optimization of learning media	0.52
8)	training is integrated with university-industry interaction programs	0.74
13)	improve "effectivity" of teamwork (more effective staff)	0.68
17)	just-in-time, just-the-right, training needs are addressed	0.47
22)	iconic (isolated) training ceases and integrated training begins	0.56
34)	employees say "there's so many good courses and so little time" instead of "are there any courses here that I should take?"	0.48
46)	realize increasingly cost effective training	0.52
50)	flexibility in sourcing world-class technical training	0.54
51)	faster transition to 90% effectiveness for new managers	0.65
71)	specialty/tactical training is available equally in all locations	0.54
100)	integrate training with on-the-job learning (both recognize & support each other)	0.60

Appendix I (continued)
Participants Bridging

Cluster 6: Organizational Training Support (cluster average = .53)

	Statement	Bridging Index
42)	increase relevant training days per staff	0.43
49)	better manager understanding of employee training and the MFA process	0.61
60)	learners become teachers and mentors to others	0.56
73)	makes new people productive as quickly as possible (faster ramp-up, e.g., to 90% efficiency)	0.51
86)	swift/immediate knowledge use (less than 3 months after course)	0.45
87)	reduced burden on mentors for training new arrivals	0.62

Cluster 7: Employee Satisfaction (cluster average = .29)

	Statement	Bridging Index
4)	better employee interpersonal and communication skills	0.45
7)	contribute to employee sense of professional (self) marketability	0.22
16)	increase employee confidence	0.22
21)	support personal broadening & job enrichment (develops employee interests in future tasks/roles/responsibilities)	0.31
32)	stimulates high level of employee interest & motivation to continue learning	0.21
38)	employee professional/educational credentials (existing expertise) are better recognized	0.17
44)	personal productivity increases	0.31
52)	long-term goal setting skills of employees are improved	0.31
59)	employee satisfaction improved	0.18
61)	employees have increased control of their training and knowledge resources	0.31
65)	facilitates employee job transitions between functions (e.g., s/w, h/w, etc.)	0.44
68)	demonstrates that the company is investing in the employee and his/her career	0.25
72)	employees look forward to training to learn something new and "neat" (rather than just fulfilling training days)	0.27
76)	highlights and contributes to specialized IC (individual contributor) path training requirements	0.40
79)	develop high level of general (employee) satisfaction with training program	0.37
81)	attracts/retains key employees (best & brightest); develops employee loyalty	0.38
94)	employees get credit/acknowledgment/rewards for their learning achievements	0.15
95)	training as self development (fun) as well as directly making us more productive (useful)	0.23
99)	employees perceive that they are receiving the best training available	0.29

Appendix I (continued)
Participants Bridging

Cluster 8: Process Awareness (cluster average = .66)

	Statement	Bridging Index
12)	develop corporate awareness	0.70
14)	more accurate estimates	0.67
70)	improve service management skills	0.63
91)	improve general product knowledge among employees	0.64
93)	all designers know & follow [SONET transport] development processes	0.67

Cluster 9: Project Preparedness (cluster average = .57)

	Statement	Bridging Index
25)	prepares staff for development programs not yet launched (anticipatory education)	0.75
26)	enables a more proactive (positive) response to change	0.61
58)	increase general telecommunications and computer (h/w, s/w) "literacy" of employees	0.63
69)	obtain "certified" special skills (such as project management or code inspection)	0.40
83)	employees are well-prepared for new (and future) technology	0.56
84)	develop tool knowledge and proficiency required to perform the job	0.53
85)	builds employee capacity and skill set to execute broader and more complex tasks	0.44
90)	develop critical/core expertise (essential scarce skills & depth of knowledge	0.65

Note: Bridging Calculation Details (Concept Systems, 1996)
Step 1: For all pairs of statements i and j, compute the proportion of sorters who put statements i and j together:

$$\text{prop}(i,j) = \frac{\text{number of people who sorted i,j together}}{\text{number of people who sorted}}$$

Step 2: Compute the raw bridging value for statement i. The top part of the formula multiplies the proportion of people who placed statements i and j together by the distance between them on the map. The distance is simply the standardized straight-line Euclidean distance computed from the x, y map coordinates. This is divided by the proportion of sorters who placed the statements together. The result gives us the average distance between point i and all other points that i was ever piled with:

$$\text{raw bridging}(i) = \frac{\text{prop}(\text{value}(i,j) * \text{distance}(i,j))}{\text{SUM}(\text{value}(i,j))}$$

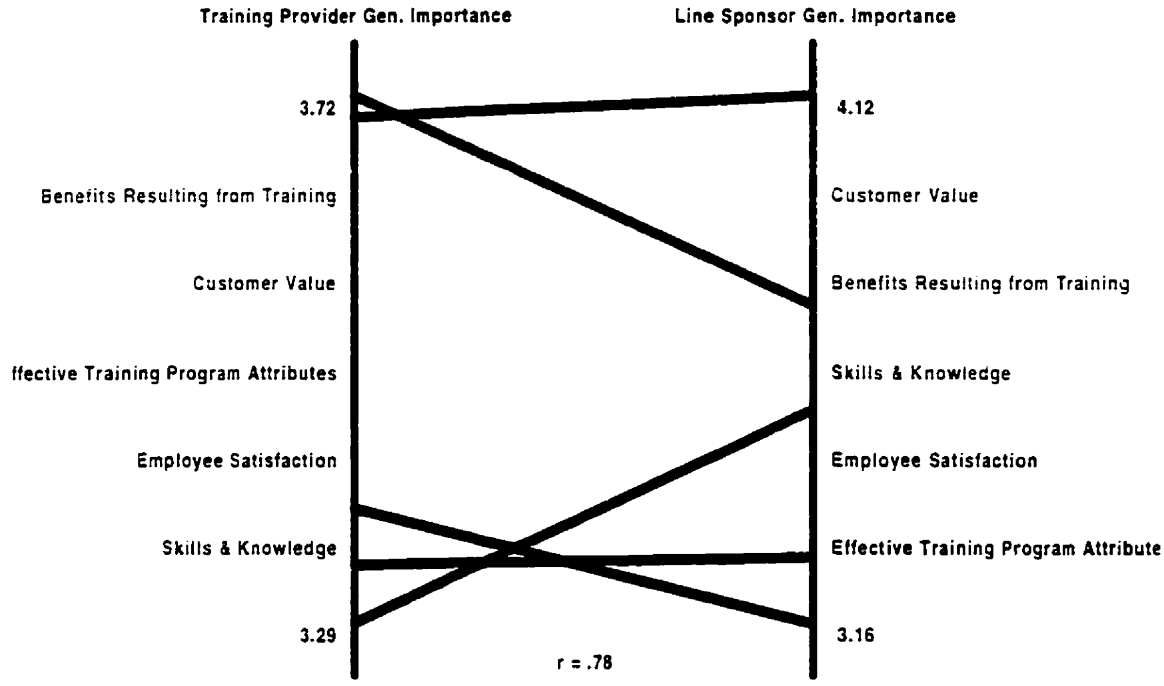
Step 3: The raw bridging value is then standardized to a 0-1 scale by:

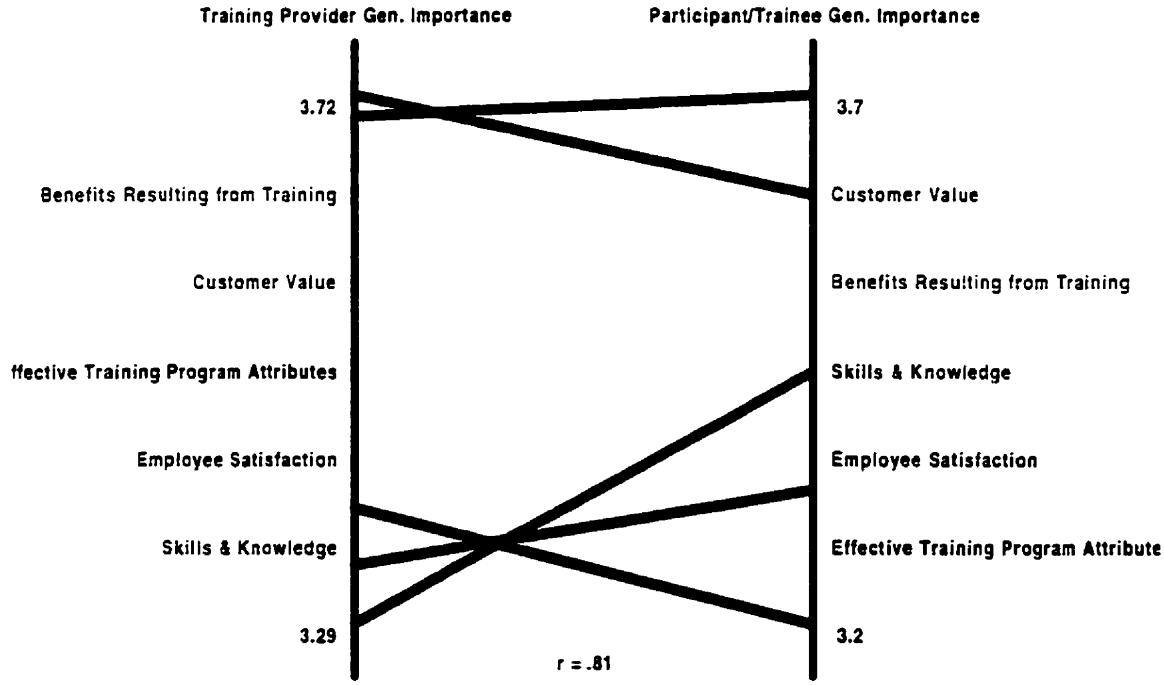
$$\text{bridging}(i) = \frac{\text{raw bridging}(i) - \text{minimum}(\text{raw bridging}( ))}{\text{maximum}(\text{raw bridging}( )) - \text{minimum}(\text{raw bridging}( ))}$$

The cluster bridging value is simply the average bridging value across all statements in a cluster.

Appendix J. Pattern Match Ladder Diagrams

Training Provider Pattern Matches





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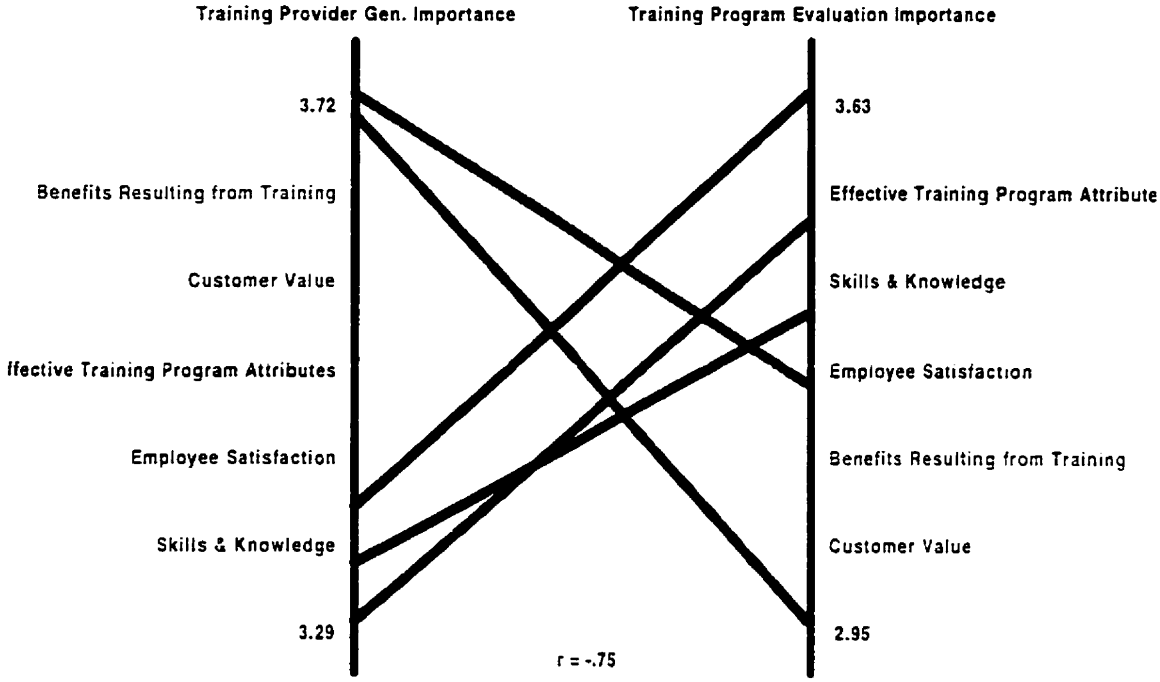

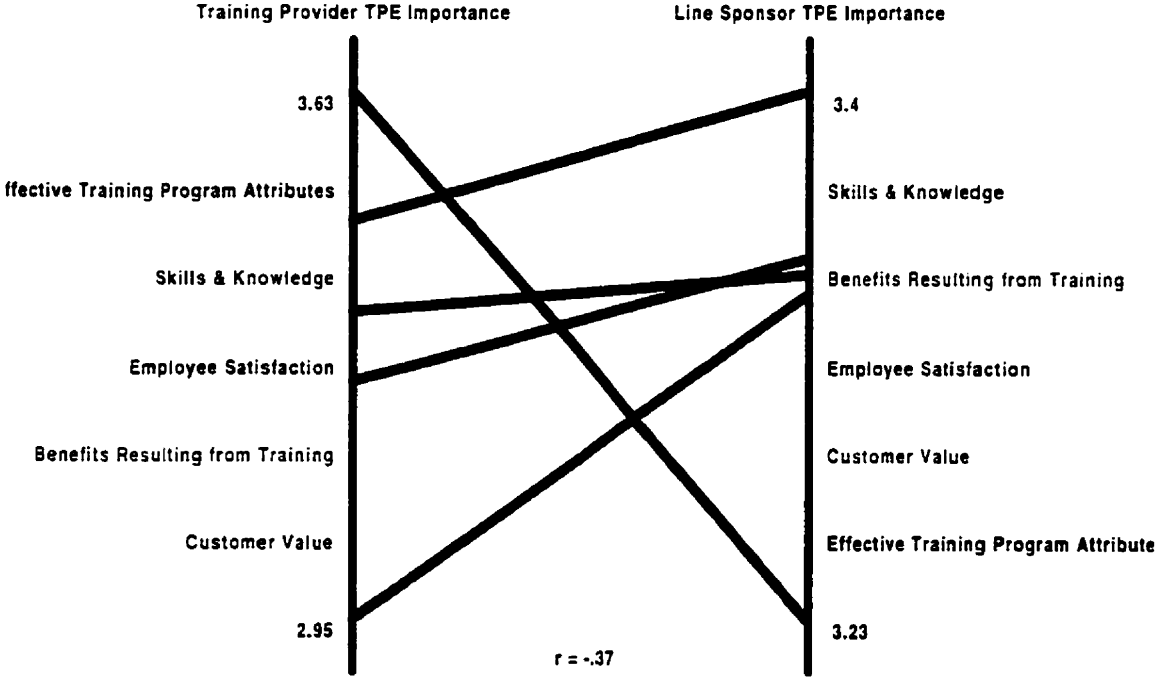

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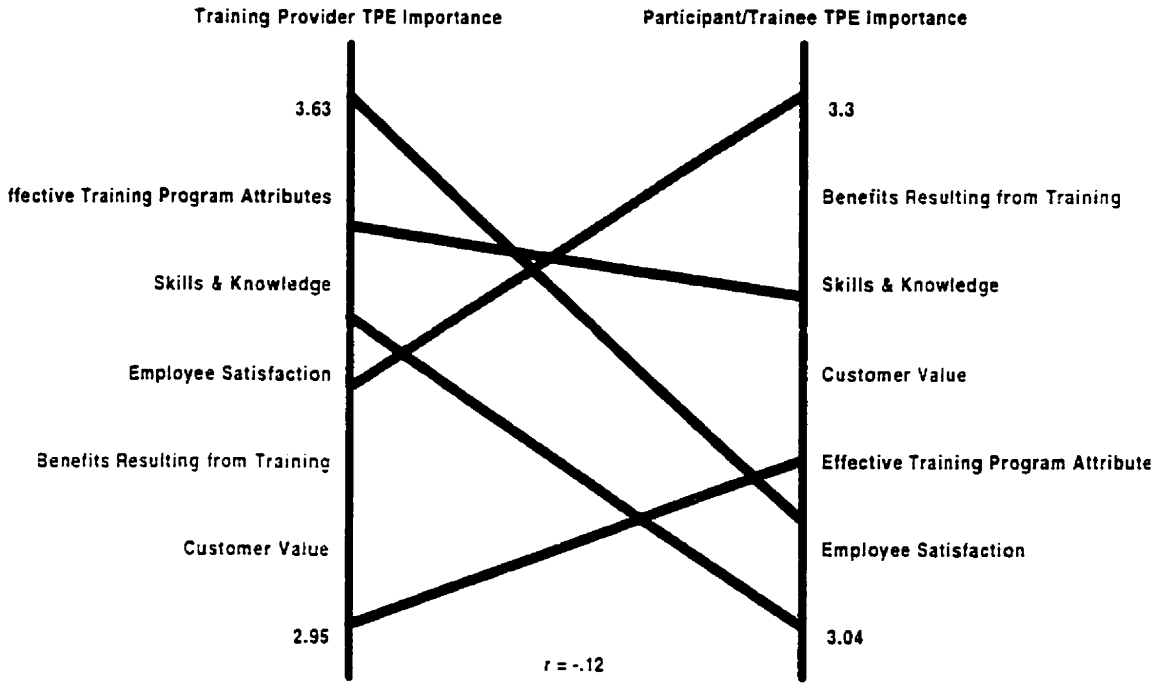

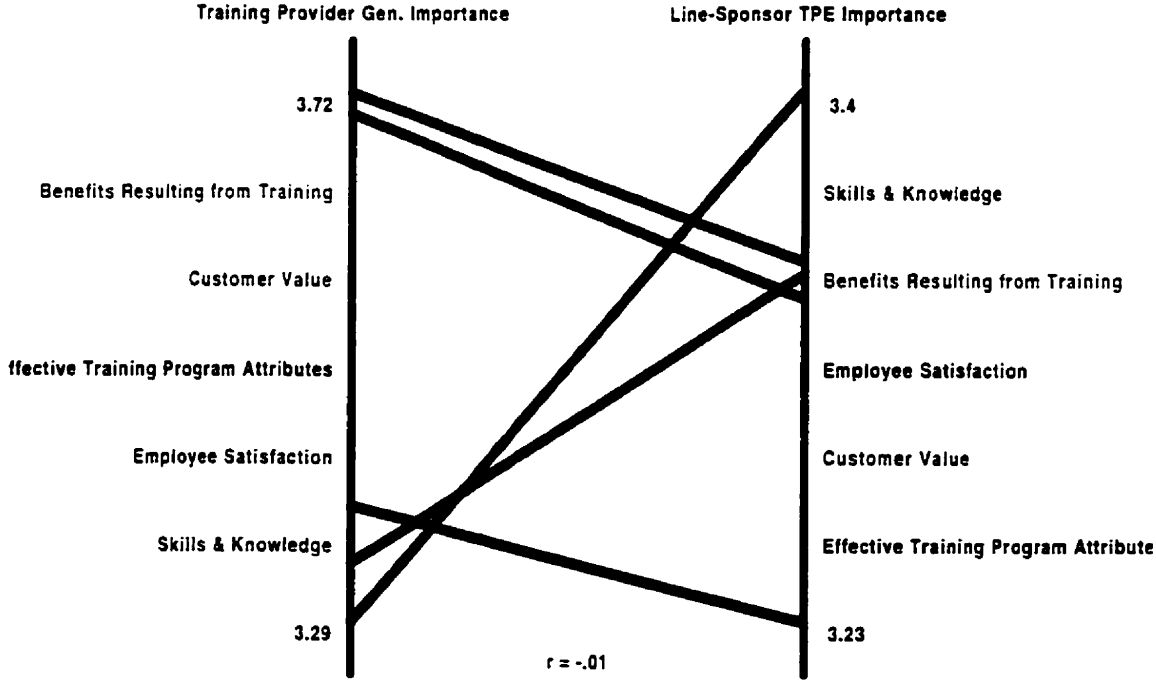

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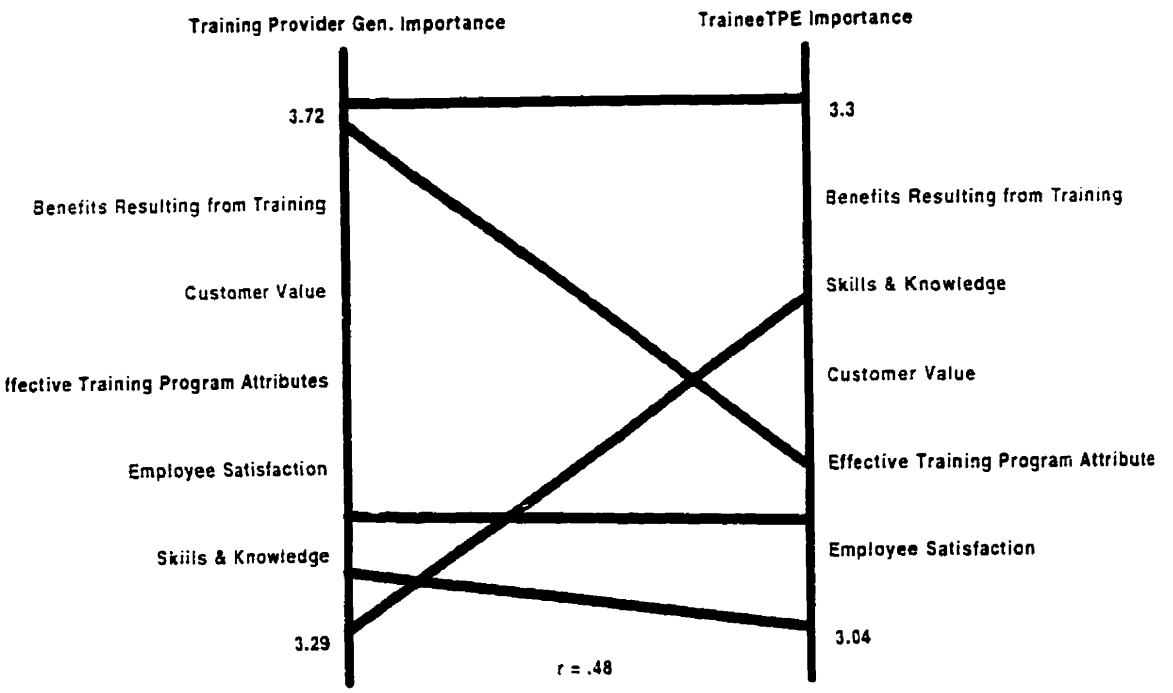
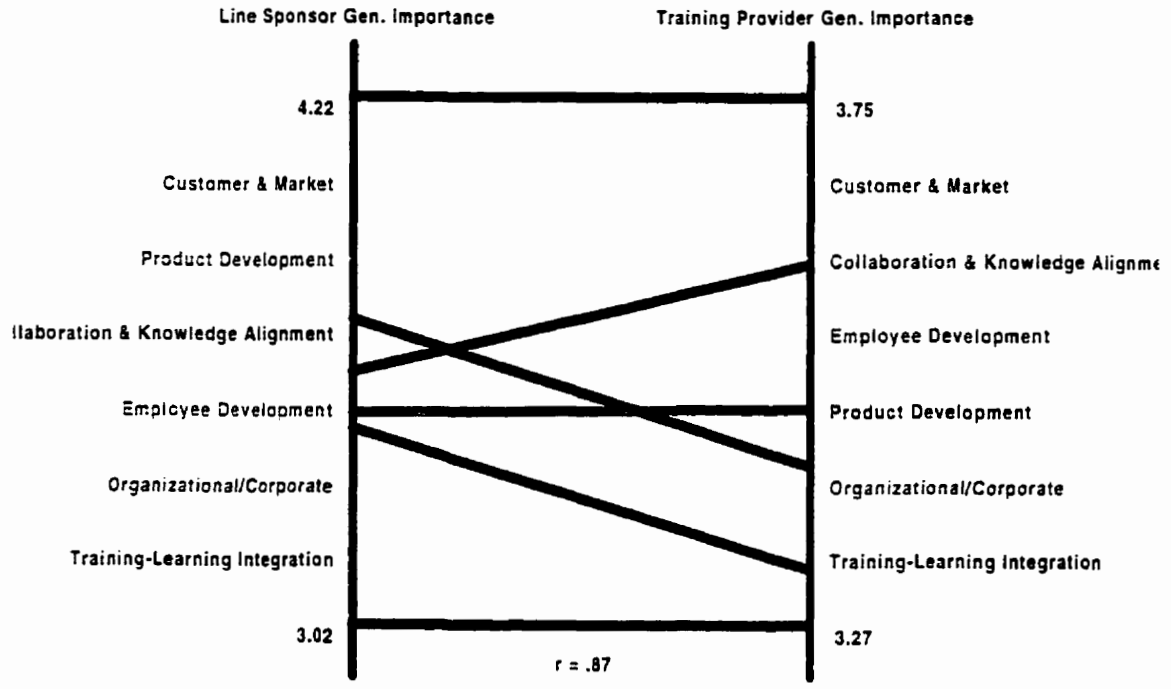
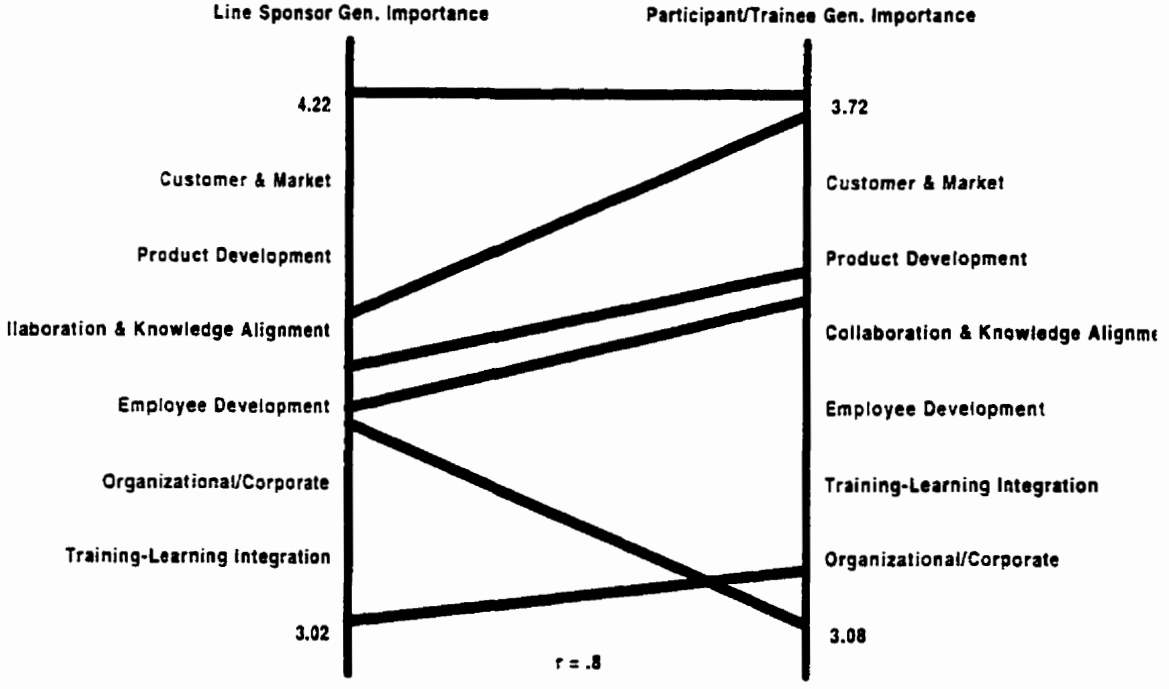


Appendix J (continued)

Line Sponsor Pattern Matches





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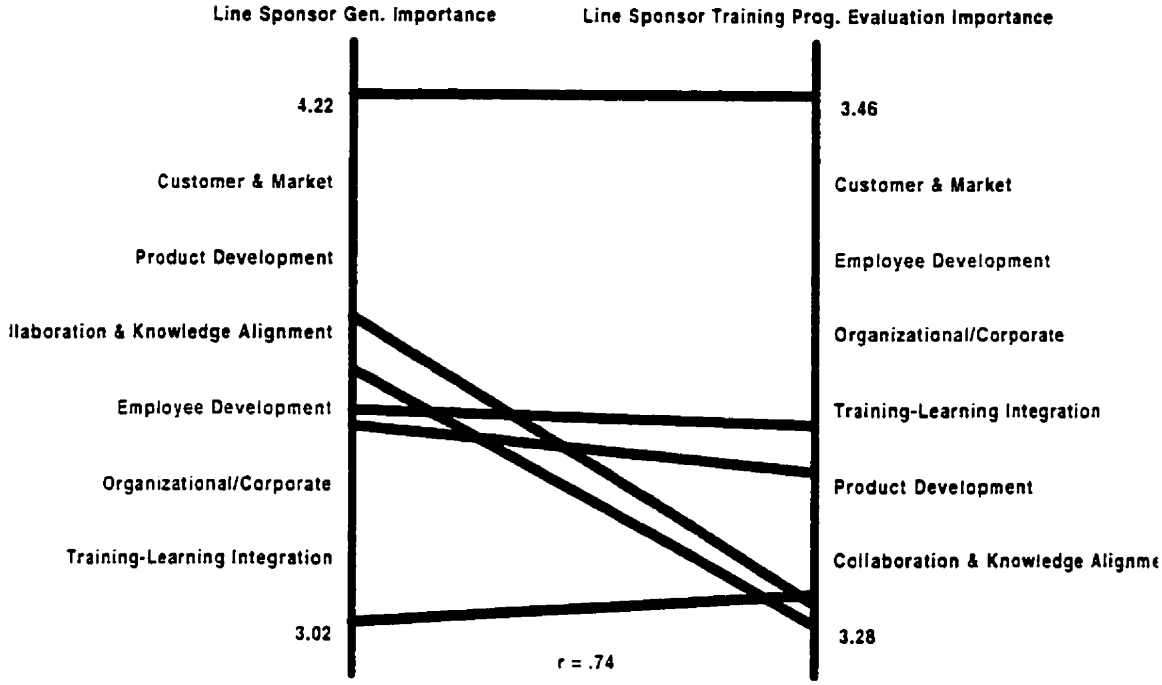

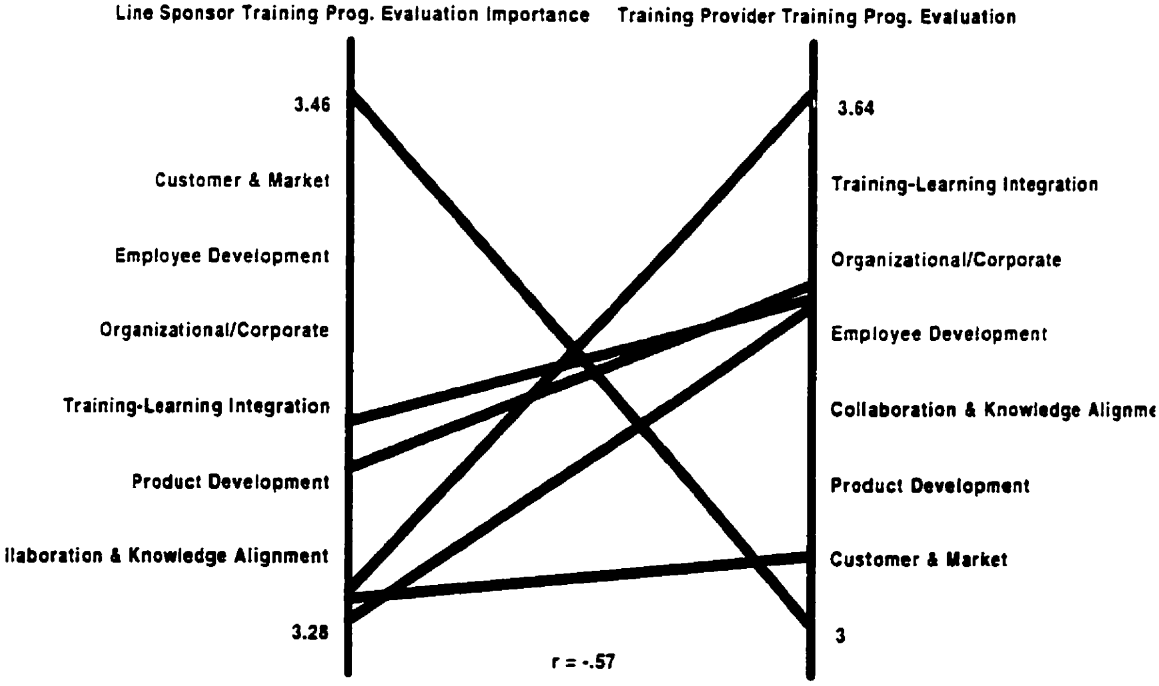

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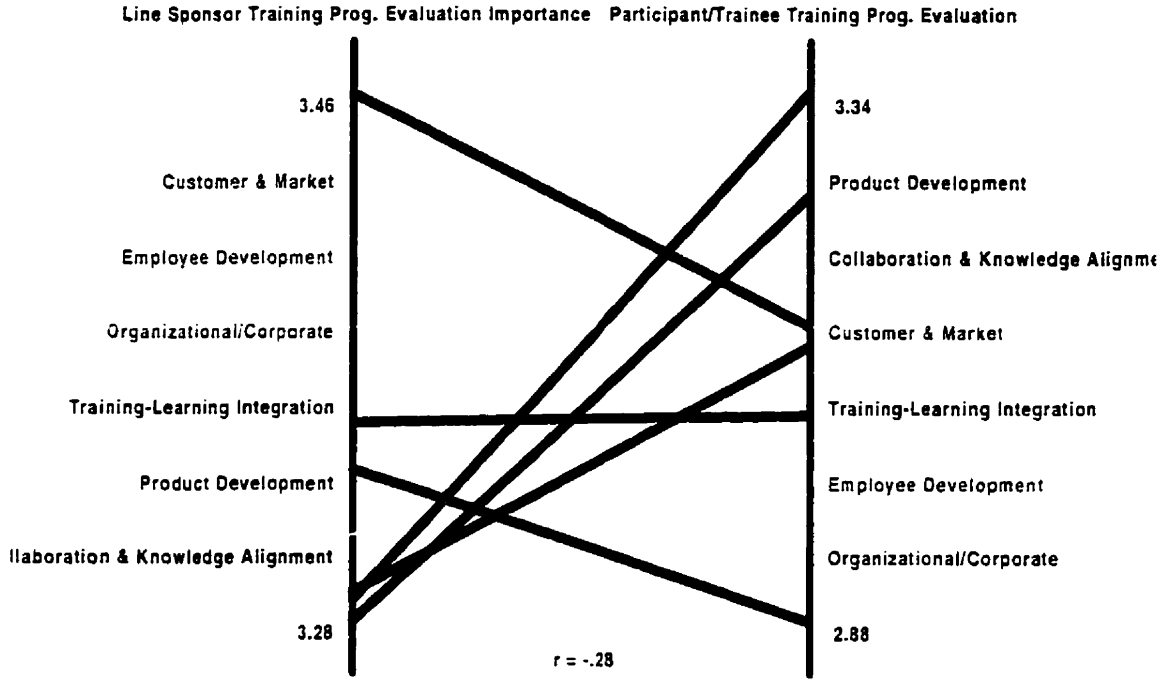

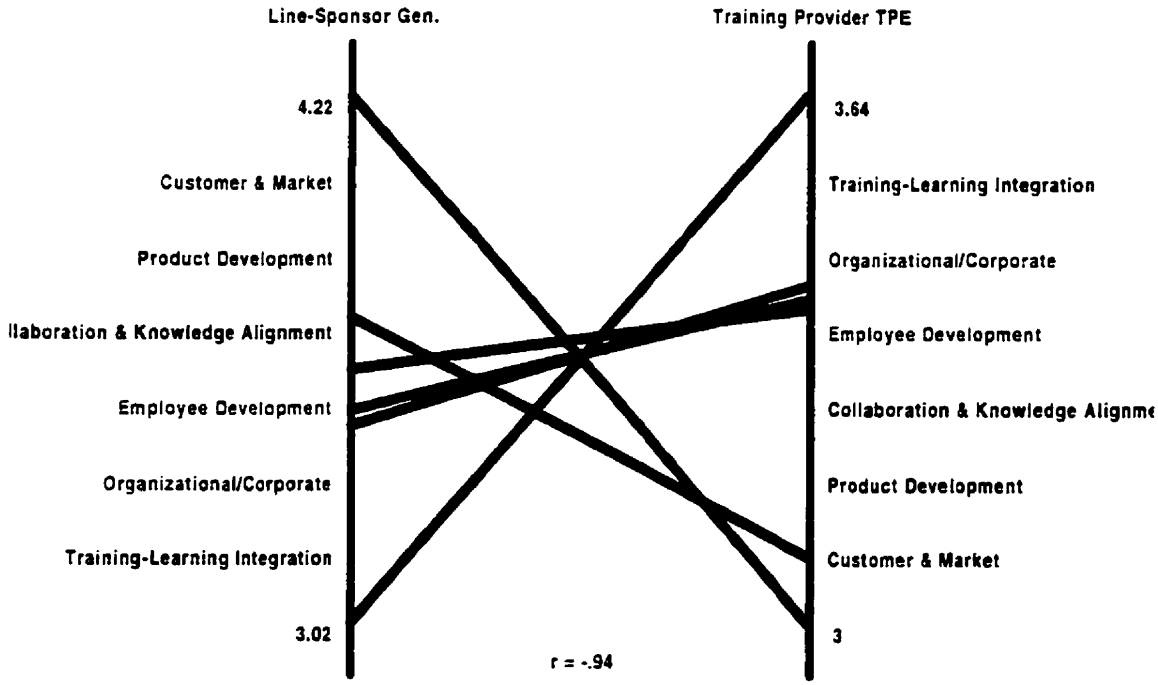

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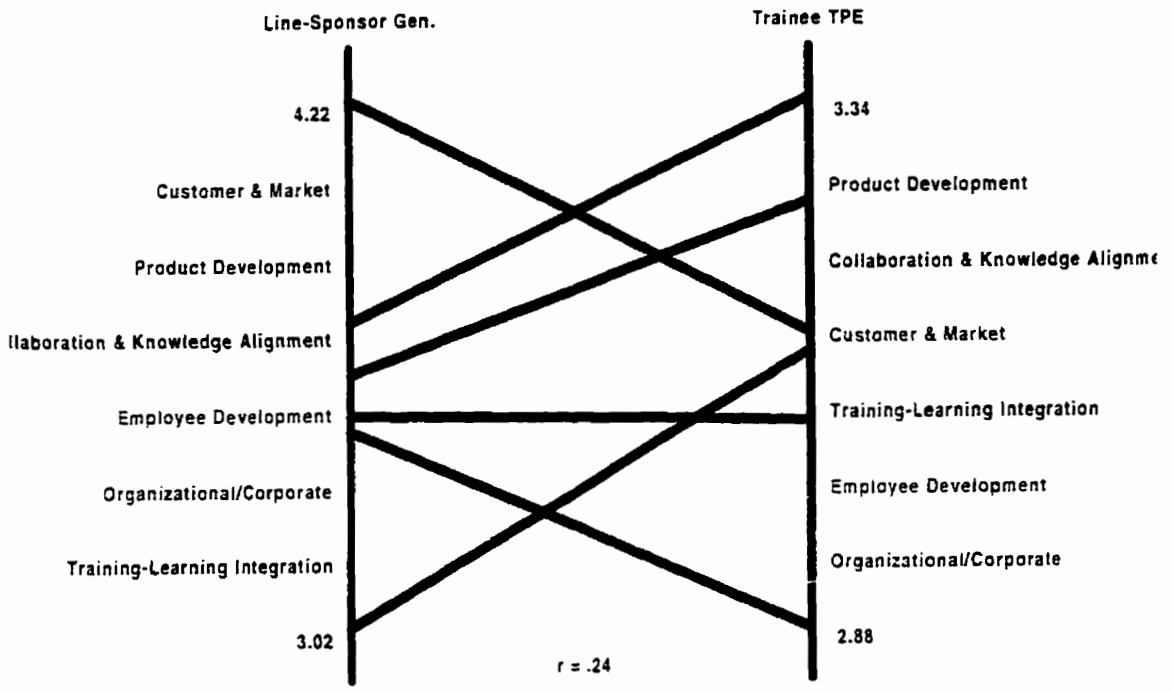
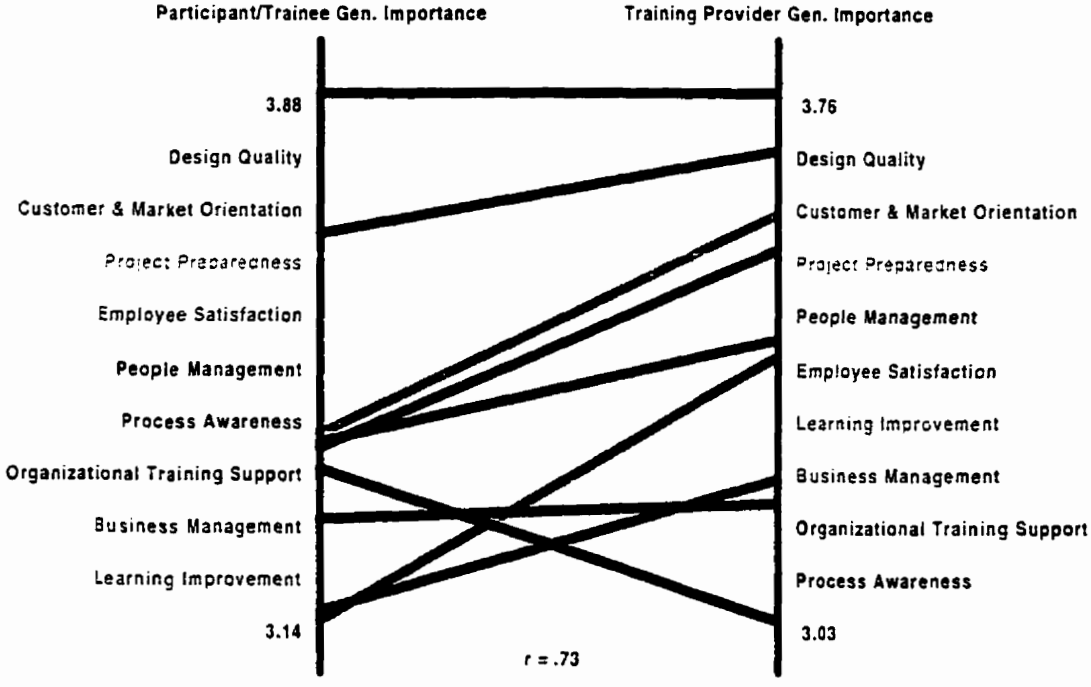
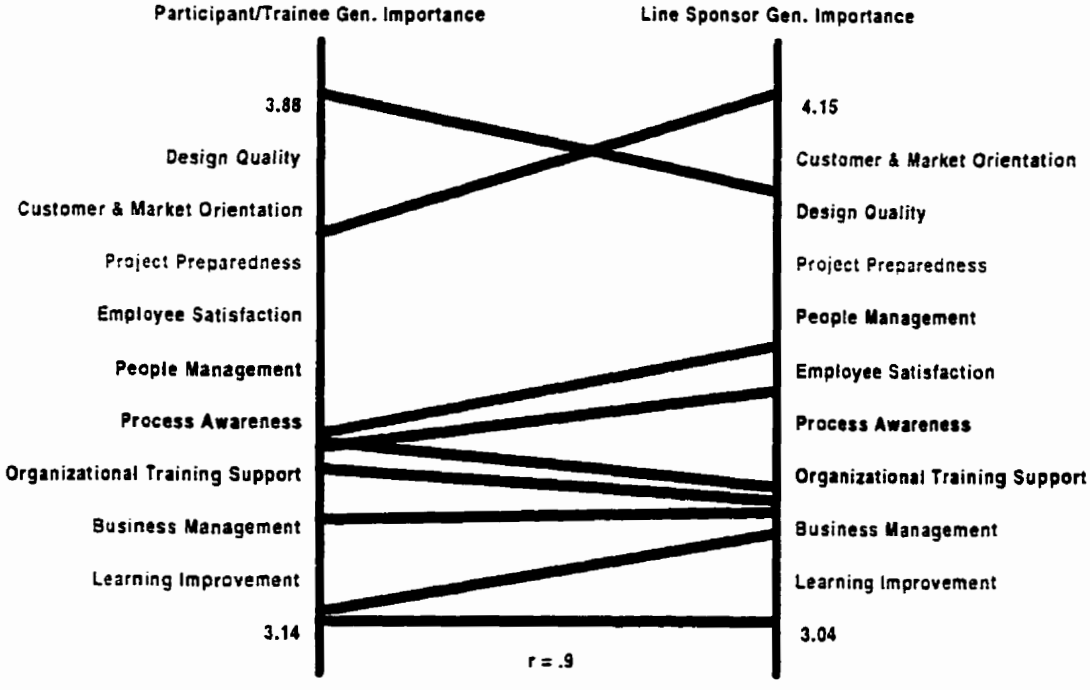


Appendix J (continued)

Participant/Trainee Pattern Matches





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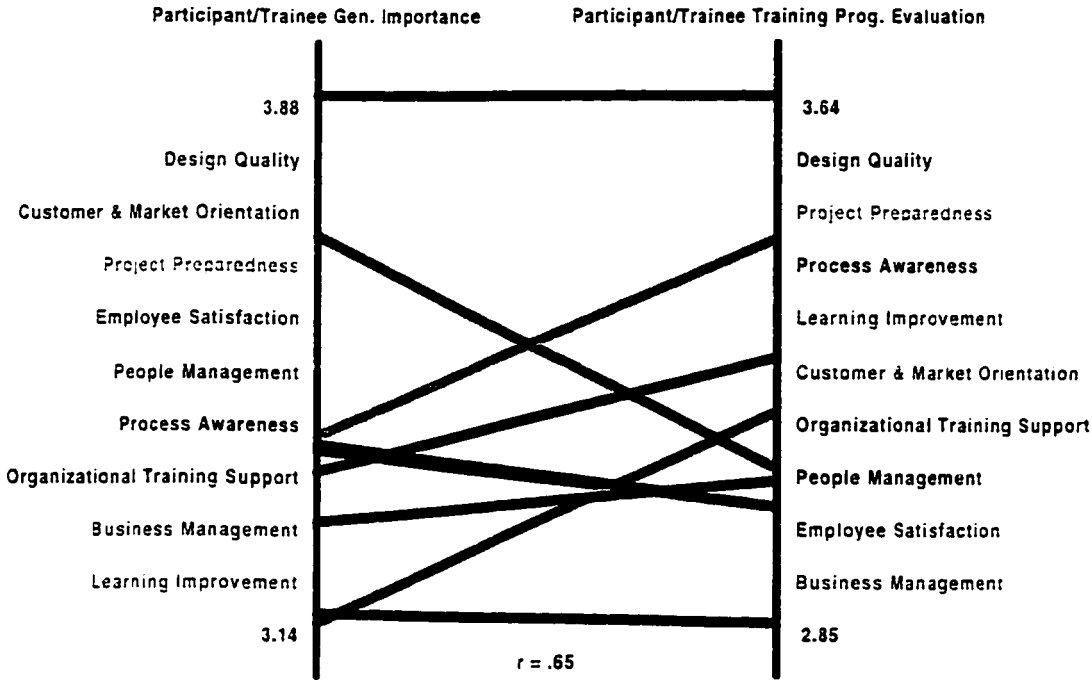
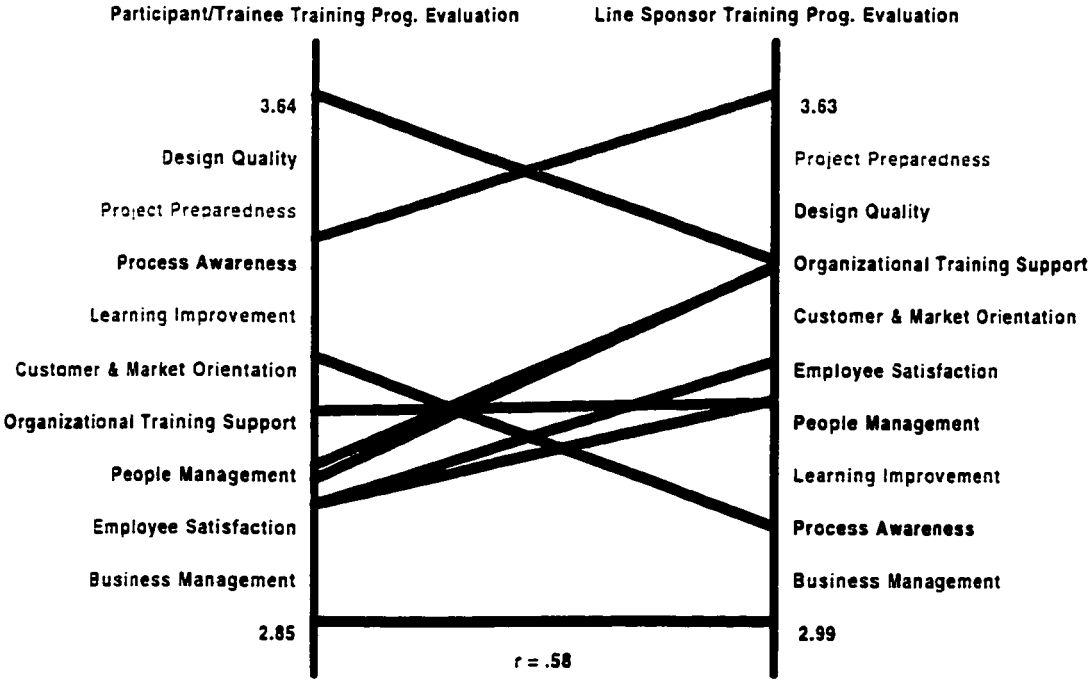
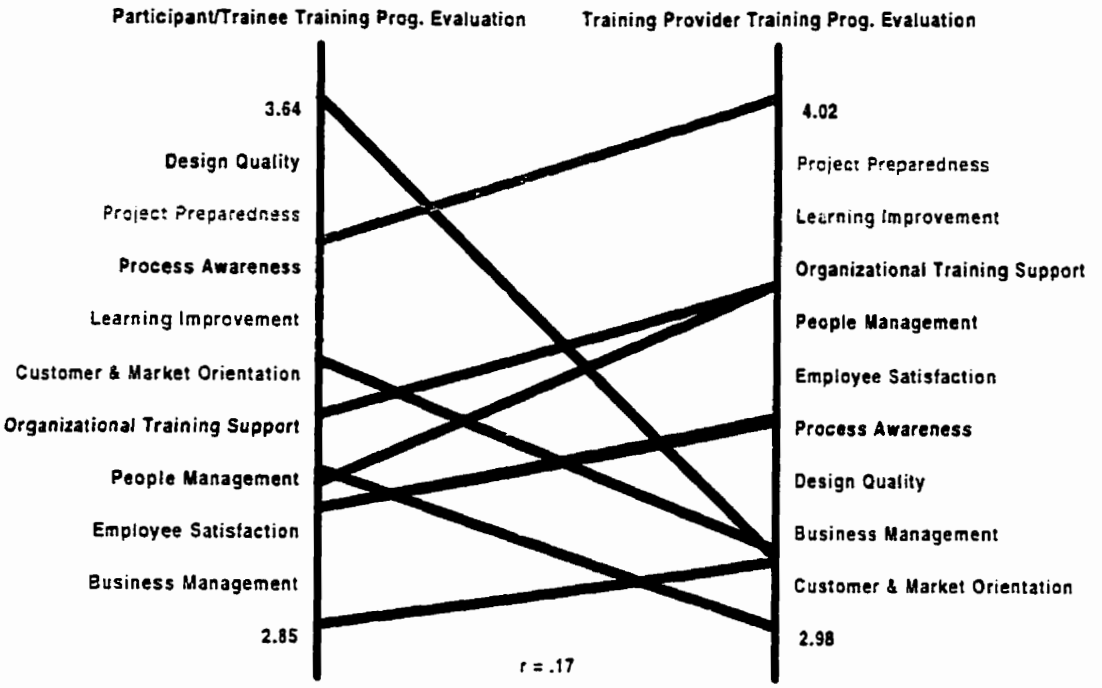
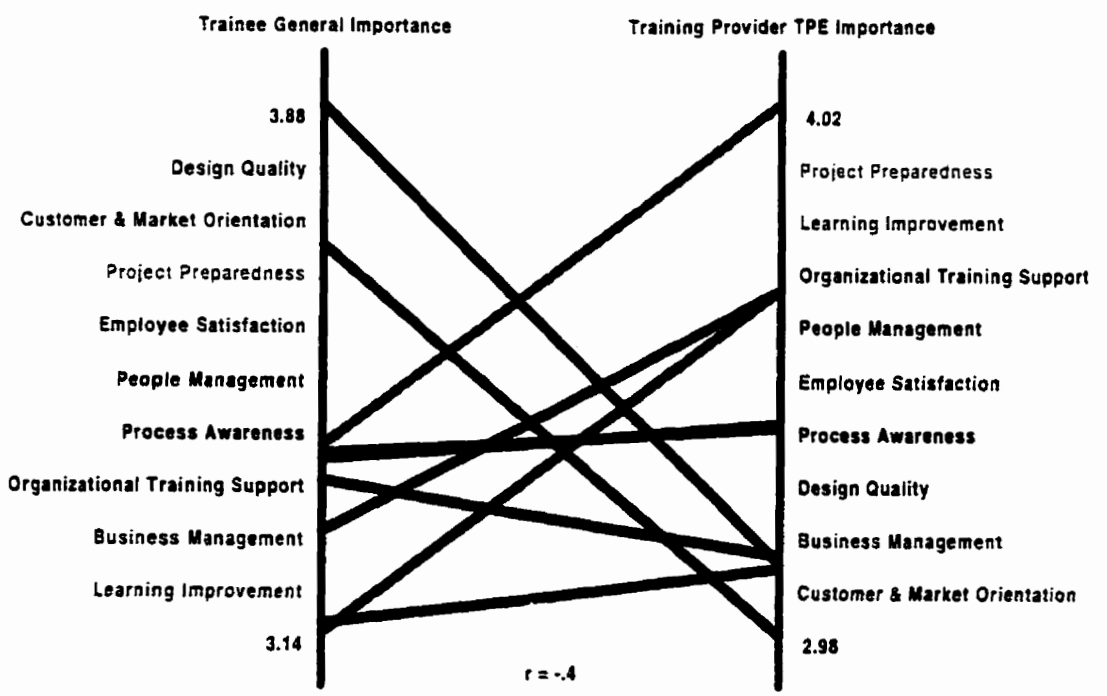


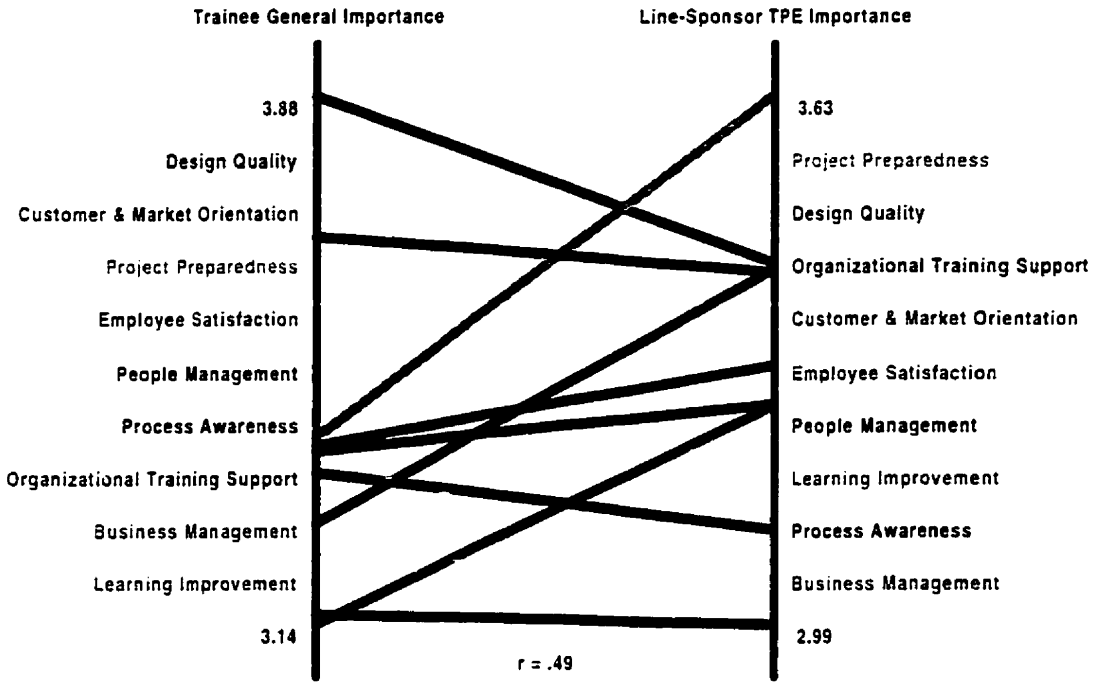


Appendix J (continued)





Appendix J (continued)

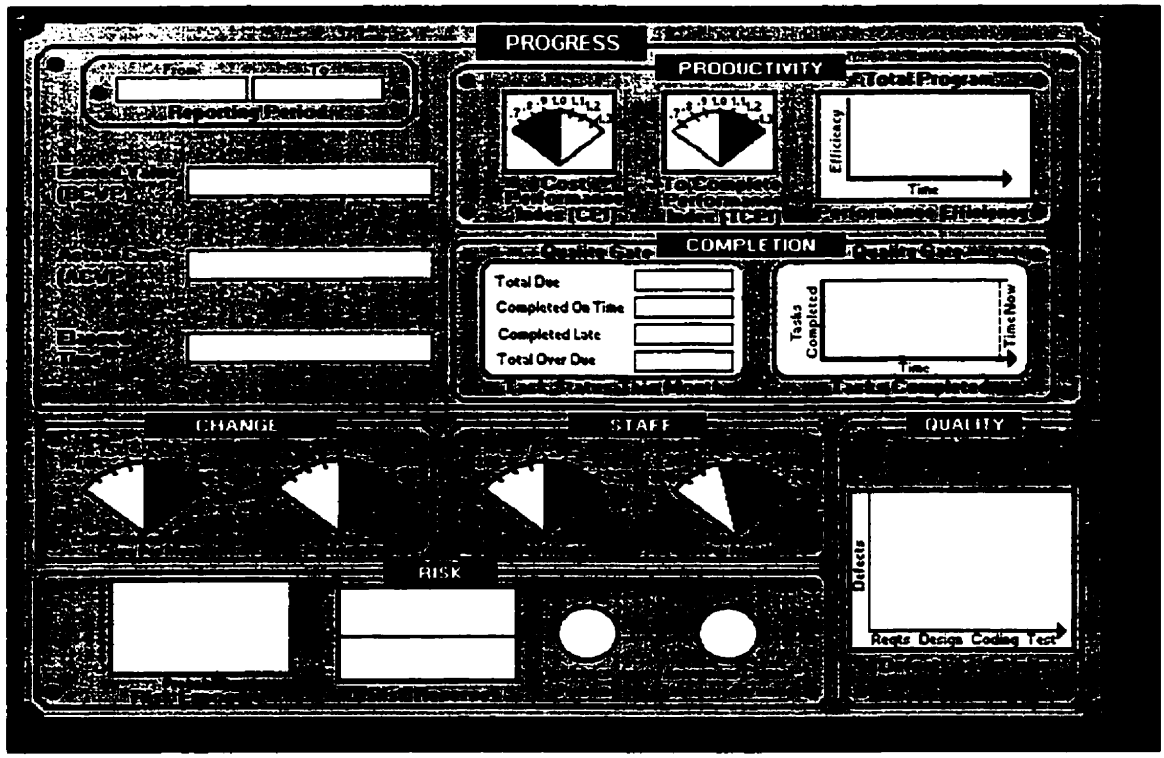


Appendix K. A Line Manager's View of Training Evaluation: The Project Dashboard

The "dashborad" was mentioned by a senior line manager as a means to display training evaluation information. The manager passed along the following information taken from the web (*http://www.spmn.com/pcpanel.html*). He described how the results of training evaluation could be incorporated into such a data display. The "control panel" displayed below is a graphical extension to a Microsoft *Excel*© Spreadsheet program.

The "Dash-Board" of Metrics Gives a "Heads-Up" of Project Status.

The project control panel is both a concept and a tool for visualizing and monitoring the condition of a project and predicting its future course. The panel facilitates the entire project team's quick determination of the status of their project, and identification of areas for improvement. The control panel was designed to help project managers keep
their projects on course when data for the control panel are updated regularly, When gauges are not in acceptable ranges, however, they indicate to management that potential
trouble lies ahead. The control panel displays information on progress, which includes productivity and completion, change, staff, risk and quality. These criteria were chosen to cover the primary areas that every project manager needs to track in order to avoid failure on large-scale software development projects.



Appendix L. Phase 3 Factor Analysis Results

Rotated Component Matrix[a]

	Component				
	1	2	3	4	5
pay	.788				
promote	.758				
custreqs	.538				
innovat	.490				
emp_cust	.460		.450		
roi		.749			
know_use		.685			
custobj	.403	.514			
dev_proc		.457			
new_emp					
qual			.772		
ttm			.640		
emp_prod				.660	
job_spec				.588	
bus_prof			.423	.579	
csat				.527	
tr_objs		.423		.502	
esat					.667
prof_dev					.640
attr_emp					.637

Extraction Method: Principal Component Analysis.
Rotation Method: Varimax with Kaiser Normalization.

a. Rotation converged in 22 iterations.

Factor Analysis of Part I Items on Training Program Results

Total Variance Explained

	Rotation Sums of Squared Loadings		
Component	Total	% of Variance	Cumulative %
1	2.462	12.311	12.311
2	2.092	10.460	22.770
3	2.057	10.284	33.054
4	1.969	9.846	42.900
5	1.849	9.247	52.147

Extraction Method: Principal Component Analysis.

Appendix L (continued)

Rotated Component Matrix[a]

	Component						
	1	2	3	4	5	6	7
aud_use	.756						
mon_use	.681						
mgrsatus	.623						
trsatuse							
rep_spon		.745					
goal_use		.587					
questnne			.659				
dec_use			.559				
trainee			.533				
rep_trsp			.513				
effctuse							
intervw				.811			
focusgrp				.760			
knowtest				.658			
tr_spec					.745		
ext_invt					.632		
sponsor		.537			.584		
formtv						.834	
summtv						.760	
rep_tran							.826
cseselus							.595

Extraction Method: Principal Component Analysis.
Rotation Method: Varimax with Kaiser Normalization.

a. Rotation converged in 9 iterations.

Factor Analysis of Part II Items on Training Program Evaluation

Total Variance Explained

	Rotation Sums of Squared Loadings		
Component	Total	% of Variance	Cumulative %
1	2.160	10.286	10.286
2	2.028	9.657	19.943
3	2.026	9.647	29.590
4	1.961	9.339	38.929
5	1.823	8.683	47.612
6	1.683	8.015	55.627
7	1.463	6.967	62.594

Extraction Method: Principal Component Analysis.

Appendix M. Questionnaire Written Comments

Part I: Managers (M>)

Training results general comments.

M> [part I question] 1.5 career development training is important--training should not be limited to job specific
M> ESAT and provide a knowledge base to build on
M> a happy, well-rounded, employee
M> improved effectiveness; improved ESAT and CSAT
M> addressing employee career objectives; correlating employee career objectives with company objectives
M> developing my tech., professional, and "people" skills; assuming that I have the basics to begin with!
M> a happy, productive, effective employee producing a high-quality effective product; poor, ineffective training is more a dissatisfier than good training is a satisfier continuous employee development; development of skills needed for future growth of [corporation]
M> new hires effectively trained and confident to act independently more often; reducing other staff's time in providing assistance; increasing quality of their output sooner; connecting them to their environment faster
M> people resources capable of performing the task; knowledgeable of what reference material and resources are available to them, and confident enough to proceed
M> increased productivity, quick familiarity with product and work environment; allow designers to stay current with leading-edge technology advances and practices
M> achieving a specific objective, be it specific skills required for a job or softer skills which can be applied generally; in the case of D1 these objectives should be driven by both business needs as well as organizational
M> motivated, confident employees
M> quality training instead of quantity; using the knowledge gained immediately or else it will be forgotten
M> long term improvement in productivity improved productivity and product quality; anticipation of customer requirements and emerging market trends
M> employees receiving training as/when needed; it must contain elements of both technical and personal development
M> both personal and professional improvement the acquisition of skills that are immediately relevant to the student's job and that can be applied with relative ease
M> [see enclosed sheet with comments] a workforce with relevant transferable skills which can be mobilized by the corporation to address current business or competitive needs employees either more productive and effective for their current responsibilities or better prepared for future growth and responsibilities; a deeper knowledge of tools, processes or skills necessary for some aspect of a current or future. position
M> effective training should broaden the employee skills and interest; it should be in line with his career interest as well as increase productivity
M> personal growth and maturity
M> many of the questions are irritating and biased; they prompt a "of course I agree but that's not the point" response from me
M> how to apply what has been learned during training employees who can make effective decisions and exploit the full potential of the tools and processes at their disposal; an organization with effective communications and processes due to the "common knowledge" in the team

Appendix M (continued)

M> happy and productive employees that are knowledgeable in both technical skills, process skills best practices, and people skills
M> making work more fun and challenging by broadening horizons and knowledge base
M> Because training is one component of a system of organizational processes it cannot be attributed as the primary cause to key business outcomes. The questions in this survey are oriented toward determining direct cause and effect which in my view is unrealistic. Until the organization operates at the full picture of processes, we will not get the behaviors and results we require.

PART II: Managers

General training program evaluation comments.

M> a program which can adopt quickly to changing needs
M> addressing employee career objectives; effectiveness of coupling employee and company objectives
M> provide opportunity for employees (mgrs., designers, etc.) to expand their personal horizons; training is a personal responsibility more than the company's responsibility, hence, TPE should result in a streamlined program providing courses to imp. the business
M> result in an accurate audit of the value currently being delivered by training
M> does the program meet the objectives; do the target audience accrue the value/knowledge desired; evaluation involves collecting evaluation data, analyzing and presenting results to trainers and sponsors; the results should be used to determine if business requirements [are met]
M> What is this "training evaluation" thing? Are you talking about a pre-existing process, some new process, or simply the act of asking people to assess the quality of courses they have taken? I have assumed it is the latter.
M> results in long term curriculum improvements
M> assess the impact on trainees' ability to apply the subject matter not just assess the fun-level if the course
M> training evaluations should be used to continuously improve training
M> this section is also irritating; could be one question; I'm getting close to throwing this survey out...
M> establish a model or metrics for long term assessment of effectiveness and return on investment
M> involve designers--movement--rather than sit and be spoon-fed
M> was this survey TPE, if so, I guess I should have answered the questions, if not, then I'm not familiar with TPE and thus not in a position to answer

Other Evaluation Purpose Comments (Part II)

M> ensure program meets stated objectives
M> assess instructor
M> address how far employee career
M> make everyone feel a part of the team
M> to see if the instructor did the job
M> identify the value to the corporation
M> to keep up with new courses and training
M> I never heard of TPE before today, therefore, I am not familiar with its objectives

Appendix M (continued)

Other Involvement Comments (Part II)

M> immediate manager
M> universities and other companies
M> benchmark
M> executive/senior management

Other Data Comments (Part II)

M> MFA objectives
M> relevance to individual; effectiveness of material/course
M> external consultants who are experts in their area
M> follow-up skills use inventory
M> metrics against objectives (defects, productivity)
M> some data are essential, but no individual data listed above are essential

Other Reporting Comments (Part II)

M> all stakeholders
M> course tutors
M> people interested in taking training
M> immediate manager
M> executive/senior management
M> upper management

Other TPE Consequences Comments (Part II)

M> to improve the training course
M> assess teacher

Appendix M (continued)

Part I: Non-Manager (NM>)

Training results general comments.

NM> employee gaining knowledge in technology he/she uses or wants to know more about
NM> career development, increased ESAT, increased employee effectiveness in specific job, increased overall CSAT
NM> trainee having new skills and knowledge to apply upon returning; a new employee not feeling overwhelmed by too much information ; an easily used, thoroughly cross-referenced index that will allow forgotten information to be updated
NM> employees knowing how to perform their job efficiently the employee gaining valuable skills that can be used directly on the job; also for planned future upgrades/developments
NM> improving the productivity of the employees; increase ESAT; open-up new job-related opportunities for employees; help retain talented employees; improve the overall competitiveness of [corporation]
NM> employee technical skills and better understanding of company products as well as market requirements
NM> more productive employees; better specific or general knowledge of the product or company better well-being for the employee which pays off for the comp. and its shareholders; employee training can be compared to health and fitness
NM> employee gaining broader technical and personal skills that may or may not apply to their immediate positions
NM> improved performance
NM> improving productivity, quality, ESAT
NM> providing training directly related to job objectives and people's interests
NM> high ESAT; improved productivity expertise and professionalism
NM> quality and productivity higher morale; employee effectiveness and better performance; better communication of complex ideas and designs; fewer conflicts due to ignorance or differences in background; a professional skilled workforce that is keeping up with changes in technology and cooperate culture
NM> immediately productive employees
NM> professional development and increased creativity in new concepts and solutions; ideally leading to creation of cooperate solutions for customers
NM> employees knowledgeable in their field; continuing training is necessary to stay on the cutting edge makes employees productive as fast as possible; improve employee-customer relations; leads to product innovations
NM> improving productivity and efficiency of product development
NM> employees that understand processes, products, and markets; this leads to innovation and consequently [to] business profitability
NM> knowledgeable, effective, and satisfied employees high ESAT, applicability to job and chance for employee career progress; no employee would stay if there is no career progress
NM> improved technical skills of participants
NM> a satisfied employee who can effectively perform assigned tasks; the outcome of assignments will be received by everyone involved--management , employee, and customer increased satisfaction and sense of self which translates to bottom-line productivity, etc.
NM> a better understanding of the job at hand by the employee
NM> providing useful tools than can be used for further development on the subject helping to develop employee's career and helping increase productivity
NM> making sure that the candidate is going to use the course knowledge right away or soon

Appendix M (continued)

NM> useful information that can be used to help to do your job more effectively; learn new concepts in order to come up with innovative ideas and design
NM> professional growth for the employee which in turn strengthens the corporation (all though not necessarily immediately)
NM> broaden employee knowledge as well as to enhance their effectiveness on the job; continuously update employees knowledge since the technology is evolving so fast
NM> increased awareness of products, processes, CSAT as well as ESAT
NM> a productive employee who is knowledgeable and competent in the job function he performs
NM> broader or deeper knowledge of relevant information or skills required in position
NM> a more knowledgeable employee in his/her job and his/her profession
NM> specific knowledge usable for employee for job at hand; gen. knowledge of the employee's field; personal skills usable on the job; gen. skills and knowledge of personal value to the employee
NM> training in areas outside the employees area of expertise should be encourage; this allows employees to make effective career moves which ultimately is beneficial to the corporation
NM> informed discussions within the design community among groups (development, verification, manufacturing, marketing etc.) and with customers employees who are more productive, satisfied and better rounded; a program which provides a balance between technical and non-technical courses as well as allows professional development in non-work related areas
NM> knowledge ready to be used at job; competence; transfer of information from experienced people to the new hire
NM> employee awareness of the tools, processes, product; increased employee sense of importance and satisfaction (ESAT); better productivity after all training is needed
NM> well-rounded employees who have competence as well as character
NM> more satisfied employees, customers; better customer relations; should develop an employee professionally and spark interest in other areas
NM> employees who are effective in their current positions and up to date with the changing world a method for employees to improve professionally and improve their knowledge; this should align with MFA objectives and cooperate objectives
NM> improve employee satisfaction
NM> career development; I hope class notes/text are made available a week before course so pre-work can be done to ask better questions in class improve the abilities in the job and in other areas for future use
NM> employee career development; self motivation
NM> improving the quality of products
NM> new knowledge; changed attitudes; standardized knowledge/behaviors/culture across [corporation]
NM> a satisfied employee
NM> improving employees' productivity and knowledge related to the product as well as business
NM> ESAT giving the people a sense of where they fit in to benefit the corporation and to fulfill the employee's career goals (business and personal)
NM> people who are willing to question past behavior and adapt behavior based on what they may have learned
NM> increased employee self-esteem; increase employee capacity to face new challenges; increase employee effectiveness in carrying day-to-day job related tasks
NM> improved employee performance
NM> LESS SURVEYS

Appendix M (continued)

NM> immediate use of knowledge on job; develop employees professionally for cross-functional and cross-utilization purposes thus increasing product quality and CSAT; innovation
NM> improved knowledge about the subject matter; and employee being able to speak intelligently about the subject matter; direct or indirect application of the new-found knowledge
NM> make new employee productive quickly; update the "technowledge" of the experienced employee; make employee work more efficiently
NM> an employee with a more varied and enhanced set of skills...knowledge of where/how/why our customers are doing what they are doing and what technologies they are using; this allows the employee to have the facts and become an innovator--everyone benefits
NM> effectively trained and satisfied participants
NM> employees very quickly coming up to speed with necessary knowledge in their area; employees
NM> being kept happy with up-to-date technical training in their area as well as personal interest courses
NM> a higher motivation in performing one's work in a creative way rather than as dull daily routine
NM> improved ESAT by addressing barriers to productivity and innovation
NM> being able to use/refresh knowledge of tools and concepts FAST; open new concepts, broaden the horizons not necessarily applicable to present work
NM> smooth the learning curve
NM> increasing employee self esteem; should be easy to fit in, being accessible by accepting and merging ALL levels of employees
<NM> employees that can adapt to a rapidly changing business enviornment;
employees that are willing/capable of anticipating future customer requirements;
an org. that can readily make a "right angle turn"; freedom for employees to
develop professionally in new areas of interest; a highly mobile workforce
<NM> more effective and more efficient employees and teams;
greater level of ESAT

PART II: Non-Managers

General training program evaluation comments.

NM> currently are quite useless...an interview, focus group, or even an after-the-fact survey (1 or 2 days) would be best
NM> improve the quality of the existing programs; lead to the design of new program to meet the new needs of the LOBs
NM> results in replacement of unqualified instructors
NM> [this person had trouble understanding the Evaluation section (pp 2-3) of survey]
NM> a continuous improvement in the material presented in the training sessions and the presenters of the material
NM> result in improved training programs
NM> effective training program
NM> not sure where to put this comment: we need a book about the course content, not just slides, which becomes useless after the course
NM> result in relevant courses, adjustments to training programs; Pt. 3 of survey fails to ask if other training (e.g., NLI) completes the missing elements in "Trans. Training" which is missing the leadership and interpersonal development that NLI provides. I am hoping it does
NM> e.g., I think that all training materials are not supportive after the course; this is a big concern; How do we gather such a global fact and act upon it

Appendix M (continued)

NM> TPE should result in employee knowledge upgrade
NM> results in determining program effects and goals
NM> generally the training program is adequate, however, it lacks some training to help employees (especially new hires) to do their day to day job
NM> accomplish some understanding about our training process
NM> improving programs, providing more up too date program
NM> making sure the course answers employee/customer needs; the course is well teached
NM> training evaluation should be sued to modify/change contents of course as well as change unsuitable instructors
NM> you guys are the professionals; I have no idea how training programs should be evaluated
NM> improved communication of subject matter to trainees
NM> improvement and outcome-oriented results
NM> result in a program that fulfills employee and business needs and that can evolve dynamically when employee and business needs change
NM> involve trainees perception of usefulness of training as applicable to their responsibilities
NM> evaluations of specific courses should be made public to help trainees and managers decide on a curriculum
NM> address courses people would like to take that are currently not offered
NM> improved training programs; facilitate employee course decisions; well-rounded employees
NM> elimination or revision of ineffective programs
NM> prune courses--discontinue some, add others
NM> training program should improve employee performance
NM> to determine if the program meets it's objectives; if not, then improve training program; if the program is meeting employee's expectations and needs; TPE should involve employees, senior business line managers; TPE should result in better training program
NM> result in continual improvement of a course whether that means changing content or instructor; most courses could be evaluated for "hands-on" time; most are lacking in this regard
NM> result in better training program
NM> optimal paced courses
NM> courses that are better tailored to the training needs
NM> result in a greater flexibility and effectiveness ensuring every trainee gets not only the training deemed necessary for his/her current job but also the training to assist career decisions and provide incentive to acquire further future knowledge
NM> help course developers improve course content and presentation to meet the needs of the trainees and line management
NM> should not have too many questions like this one, it causes the last section to be done fast
<NMNM> confirm effectiveness of the program to achieve it objectives and provide information on where to improve the program especially when obectives are not being met

Other Evaluation Purpose Comments (Part II)

NM> to play golf on Mars [strongly disagree]
NM> [to determine] whether other new programs should be introduced
NM> new ideas or areas for training
NM> whether the program is effective
NM> to judge the quality of the instructor
NM> to see if it corresponds to employee needs

Appendix M (continued)

NM> effectiveness of teacher
NM> determine the training require
NM> compare ours with other companies
NM> gather needs from trainees
NM> monitor specific courses
NM> to evaluate trainee's objectives
NM> evaluate the usefulness of the program
NM> more statistics?
NM> do the students get out of training what is needed
NM> not just to gather statistics
NM> to help instructor understand the trainee's need
NM> waste time
NM> the effectiveness of the training program
NM> it imparts useful skills/knowledge
NM> prioritize specific programs, courses, etc.
NM> ensure that business needs are met
NM> improve training program
NM> whatever uses the training team chooses
NM> to see what has been gained from the program
NM> remove ineffective training
NM> if the instructor is appropriate
NM> improve instructors
NM> both 2.1 and 2.2
NM> to evaluate the instructor
NM> to determine the degree of success
NM> to improve content and presentation of material
NM> if the instructor is competent
NM> to see if the content is adequate

Other Involvement Comments (Part II)

NM> trainers (the ones training)
NM> subject matter experts (sme's)
NM> managers
NM> trainees' managers
NM> individual contributors [IC's]
NM> immediate manager
NM> customers
NM> next level of management
NM> auditors
NM> trainers
NM> specialists
NM> business line managers for future ventures
NM> individuals who deliver training
NM> teacher himself

Appendix M (continued)

Other Data Comments (Part II)

NM> written comments from trainers
NM> post-training (1 month) feedback
NM> course feedback after a month
NM> cocos [e-mail] feedback after course completion
NM> technological domain trends
NM> follow-up
NM> MFA training record
NM> feedback from trainees that are attempting to apply what they have learned
NM> observation by external expert
NM> trainer feedback
NM> employee performance on learned topics
NM> written comments of lecturers
NM> feedback

Other Reporting Comments (Part II)

NM> trainers
NM> employees outside line management
NM> instructors
NM> the world wide web
NM> customers
NM> all interested parties
NM> whomever applicable (based on need)
NM> trainers
NM> anyone in the organization
NM> lecturers
NM> [corporation]'s community

Other TPE Consequences Comments (Part II)

NM> improving trainer ability and knowledge level
NM> be used [to] gauge overall effectiveness
NM> to determine if the program should continue
NM> to improve course presenter presentation
NM> to explore new training areas
NM> to decide which courses to keep
NM> as a means to ensure greater ESAT
NM> should be used to assist managers select courses

Appendix N. Code and Index Structure for Study Phase 3 Survey Written Comments

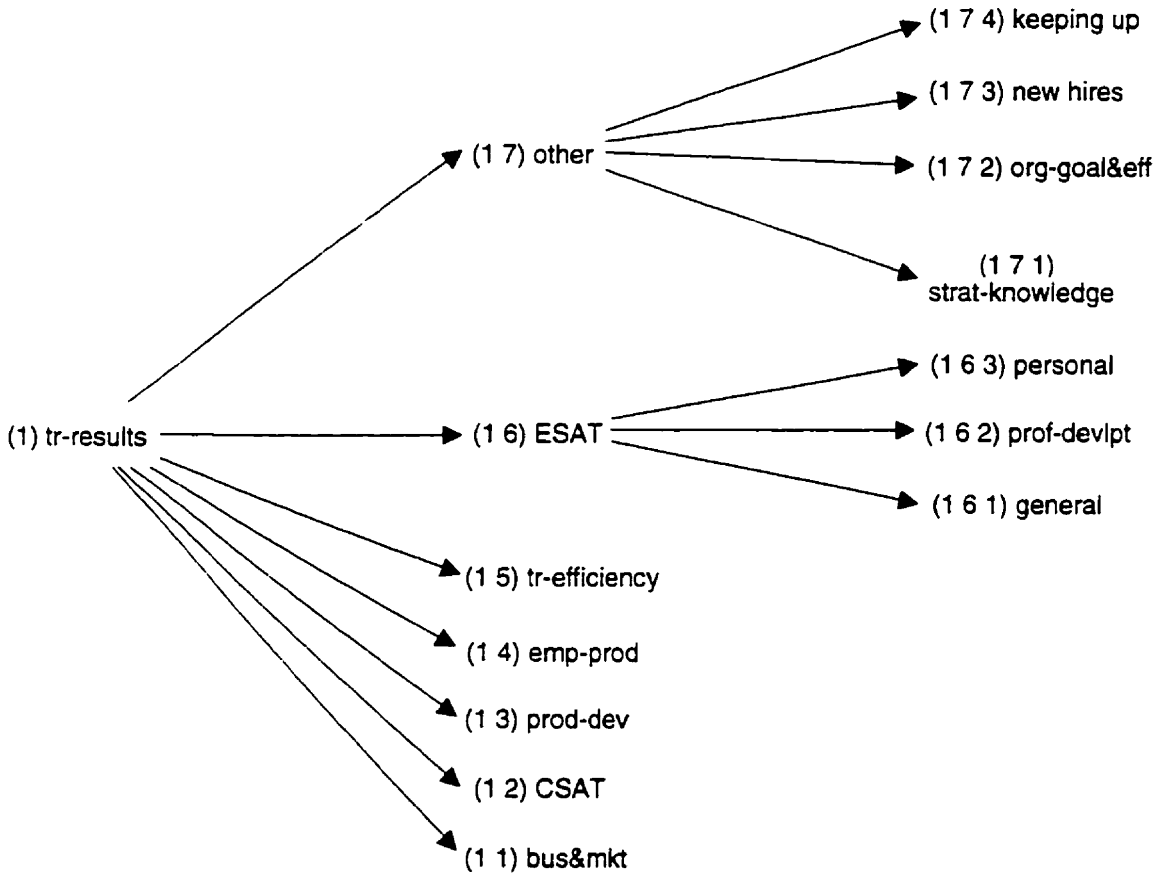
(1) /tr-results: training program results
(1 1) /tr-results/bus&mkt: business and market
(1 2) /tr-results/CSAT: customer satisfaction
(1 3) /tr-results/prod-dev: product development
(1 4) /tr-results/emp-prod: employee productivity
(1 5) /tr-results/tr-efficiency: training efficiency
(1 6) /tr-results/ESAT: employee satisfaction
(1 6 1) /tr-results/ESAT/general: general employee satisfaction
(1 6 2) /tr-results/ESAT/prof-devlpt: employee professional/career development
(1 6 3) /tr-results/ESAT/personal: employee personal development
(1 7) /tr-results/other: other training results*
(1 7 1) /tr-results/other/strat-knowledge: strategic knowledge*
(1 7 2) /tr-results/other/org-goal&eff: organizational/company objectives/efficiency*
(1 7 3) /tr-results/other/new hires: newly hired employees*
(1 7 4) /tr-results/other/keeping up: keeping up with technology*

(2) /tr-eval: training program evaluation
(2 1) /tr-eval/purpose: training program evaluation purpose
(2 1 1) /tr-eval/purpose/formative: formative purposes
(2 1 2) /tr-eval/purpose/summative: summative purpose
(2 1 3) /tr-eval/purpose/other: other purposes of TPE
(2 1 3 1) /tr-eval/purpose/other/instructor: evaluate the instructor
(2 1 3 2) /tr-eval/purpose/other/team: team involvement
(2 1 3 3) /tr-eval/purpose/other/benchmark: compare with other companies and organizations
(2 2) /tr-eval/process: TPE processes
(2 2 1) /tr-eval/process/involvmt: involvement
(2 2 1 1) /tr-eval/process/involvmt/mgt: management
(2 2 1 2) /tr-eval/process/involvmt/other: other individuals or organizations
(2 2 1 3) /tr-eval/process/involvmt/trainees: trainee involvement
(2 2 1 4) /tr-eval/process/involvmt/tr-devlpers: training developers
(2 2 1 5) /tr-eval/process/involvmt/SME's: subject matter experts
(2 2 2) /tr-eval/process/data: data
(2 2 2 1) /tr-eval/process/data/MFA: annual employee performance appraisal record*
(2 2 2 2) /tr-eval/process/data/other: other data
(2 2 2 3) /tr-eval/process/data/instructor: instructor/sme*
(2 2 2 4) /tr-eval/process/data/timing: timing of data collection
(2 2 2 5) /tr-eval/process/data/emp-perf: employee performance*
(2 2 3) /tr-eval/process/reporting: evaluation reporting
(2 2 3 1) /tr-eval/process/reporting/mgt: management
(2 2 3 2) /tr-eval/process/reporting/other: others
(2 2 3 3) /tr-eval/process/reporting/instructors: instructors/sme's
(2 2 3 4) /tr-eval/process/reporting/trainees: trainees
(2 3) /tr-eval/consequence: TPE consequences
(2 3 1) /tr-eval/consequence/knowledge: increased or improved knowledge*
(2 3 2) /tr-eval/consequence/emp-needs: employee needs*
(2 4) /tr-eval/current probs: problems with current system*
(2 5) /tr-eval/courses: course-focused*

*denotes add-on code developed after initial start codes were defined

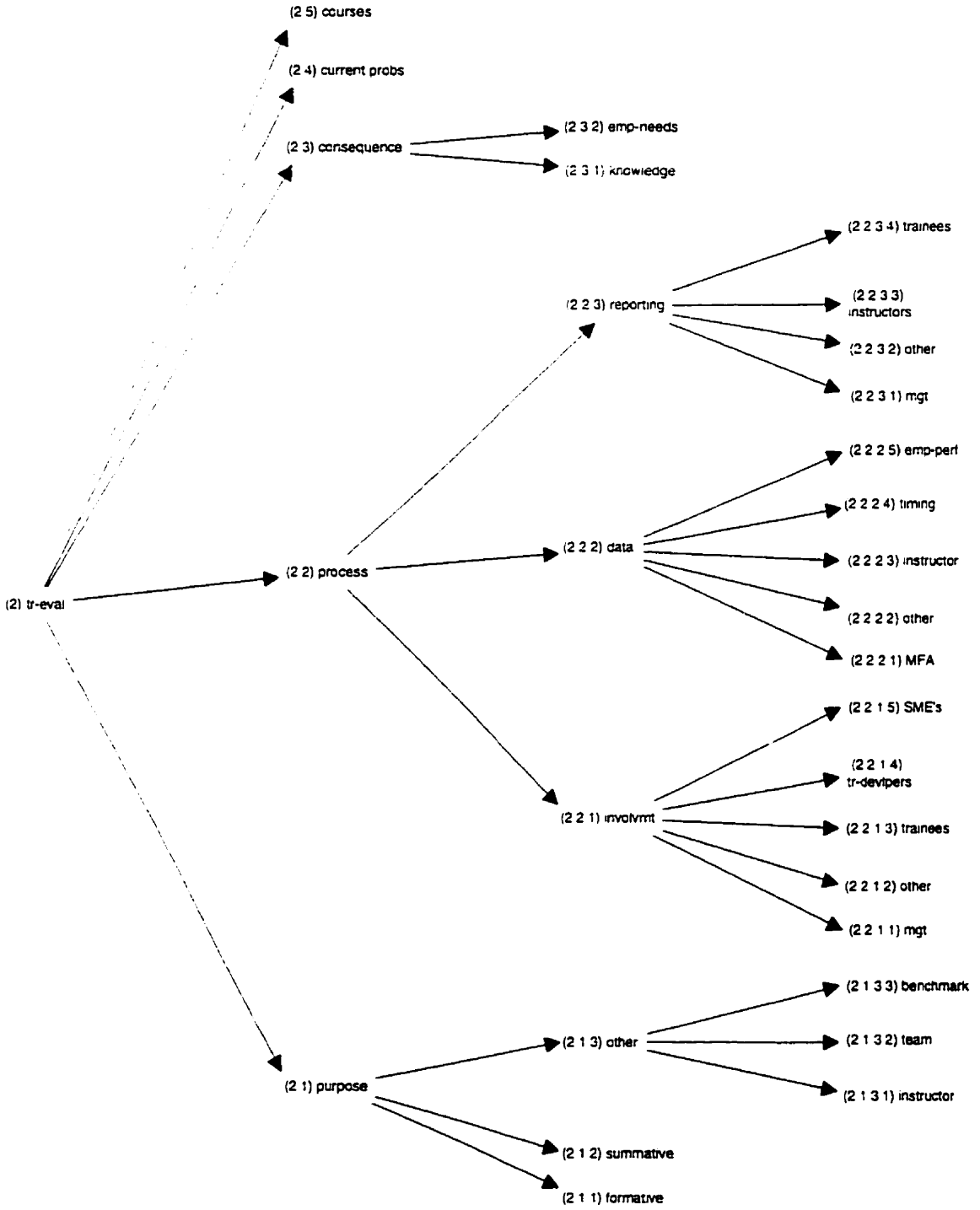
Appendix N (continued)

Index tree for study phase 3 training results written comments



Appendix N (continued)

Coding index tree for study phase 3 evaluation written comments.



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Michalski, G. V. (1983). An analysis of end check damage in red oak boards in relation to acoustic emission count rate/stress wave factor. Unpublished master's thesis, Virginia Polytechnic Institute & State University, Blacksburg, Virginia, USA

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Michalski, G. V. (1997). Stakeholder variation in perceptions about training program results and evaluation: A concept mapping and pattern matching investigation. Paper presented at the annual meeting of the American Evaluation Association, San Diego, CA, November.

Michalski, G. V. (1998). A qualitative study of stakeholder variation in training program evaluation. Paper presented at the 12th annual Edward F. Kelly Evaluation Conference. University of Ottawa, Canada, April.

Michalski, G. V., & Cousins, J. B. (1998). Do views about training program evaluation depend on perceived ideal program results? Variation among stakeholder groups. Manuscript in preparation, University of Ottawa, Canada.

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Michalski, G. V. (1999). Training evaluation in the knowledge-based organization: A research framework based on multiple methods and stakeholders. Paper submitted to the Canadian Evaluation Society's Best Student Essay competition, January.

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Michalski, G. V. (1999). A quantitative training program evaluation. Paper presented at the 13th annual Edward F. Kelly Evaluation Conference. Queen's University, March 19.

Michalski, G. V. (1999). Stakeholder variation in perceptions about training program evaluation. Poster presented at Jean-Paul Dionne Symposium. University of Ottawa, March 25.

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Employment Summary

- Employee and Organizational Learning. Nortel Networks. 1998 to present.
- Training Specialist. Bell Northern Research/Nortel Technology. 1993 to 1998.
- Senior Training Engineer. Zenith Data Systems. 1990 to 1993.
- Instructor of Electronics and Computer Science. Lake Michigan College, 1988 to 1992.
- Senior Educational Media Designer. Heathkit Educational Systems. 1987 to 1990.
- Instructor of Computer Technology. Jordan College, 1988 to 1990.
- Supervisor, Circuit Board Manufacturing. Heath Company. 1986 to 1987.
- Instructor of Electronics Technology. Illinois Technical College. 1984 to 1986.
- Graduate Teaching Assistant. Virginia Polytechnic Institute & State University, 1981 to 1983.

Personal

Born: April 26, 1958, Evergreen Park, Illinois
St. Mary Star of the Sea School, Chicago, Illinois (1964 to 1972)
St. Laurence High School, Burbank, Illinois (1972 to 1976)
Married, one son.