# AGENTS OF CHANGE: A NEW ROLE FOR LEARNERS IN ONLINE WORKPLACE TRAINING

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**Abstract**

Workplace training design has evolved from a task-based systems framework managed by the designer, to a collaborative process of problem-solving that includes stakeholders across the enterprise. Collaborative design models address persistent problems, such as cost efficiency, requirements that change late in development, and aggressive timetables, but perceptions of training effectiveness continue to be pessimistic. Given the substantial role of employees in making training effective, by transferring what they learn to their day-to-day responsibilities, this study proposed an emergent design model in which designers collaborate with employees as partners in solving training design problems. Previous efforts to include employees in training design have faltered, because of time and resource requirements which limit participation or greatly expand timelines. This study investigated the potential of broad employee participation, through the widely-used medium of organizational surveys, in which employees are invited to suggest ways to improve their work environment. The study applied a three-phase, mixed methods approach, to investigate whether survey text responses contain viable input into training design, and to explore the nature of that input in terms of major themes about workplace training, and detailed input reflecting employees' experience of online training. Nearly 90,000 text responses were accepted into the study, from industries that include pharmaceuticals, retail, manufacturing, telecommunications and financial services. Analysis exposed the inherent conflict between the designer's focus on training delivery, and the employees' focus on transferring what they learn to their jobs; and a widespread organizational conflict between leadership compensation tied to short-term financial metrics, and long-term strategies that drive infrastructure programs such as workplace

training. Responses across all industry sectors in the study reported limited management support for training, which is nonetheless essential to employees' job performance. Responses described online training that makes only minimal use of the basic functions of computer technology. The study validates earlier research questioning workplace training effectiveness, with evidence suggesting that training programs are constrained by organizational challenges that cannot be solved by designers alone. The study suggests that organizations can involve their employees in addressing the conflicts that limit training effectiveness, through design partnership using survey responses.

## Dedication

For my mother, who cleared the path for me many years ago, and has been my friend and guide through this transforming experience:  to Dr. Betsy.

**Acknowledgments**

Giving employees a seat at the table has been a seed trying to find fertile soil in the back of my mind since the 1980s, when I was the advocate for employees in major system design projects. How could we not involve them in the design when they would surely be expected to make those systems work? As a qualitative analyst in support of organizational survey providers, I read employees' comments about their workplace training programs at the same time I was studying toward this degree, comments that were often disparaging about the designs I was learning how to use. It took a long time to understand how to complete the circle by inviting employees into the training design, and I did not reach this understanding alone.

Above all, I owe a profound debt of gratitude to my mentor, Dr. Rod Sims, who has strewn my path with the right questions and suggestions since that first learning theory course, when I met Perkins and Jonassen, and Hardré and Cunningham, and Dr. Bruner and MACOS. Dr. Rod introduced me to the *interaction* as the central, living, breathing structure of learning; everything I have learned since has given depth and breadth to the powerful idea that learning occurs in the interactions between learners and their teachers and peers and resources.

I am deeply grateful to Dr. Bruce Francis, and to Dr. Elena Kays, for their work on emergent learning designs, founded on the beautiful idea of the studio, in which each participant is an artist, bringing unique skills and perspectives, all of which, in the normal flow of activities, generate new ideas and designs that none of the individuals could have created alone. Employee contributions to training design are surely an emergent property of organizational surveys.

I am also deeply grateful to Dr. Mike Medley for his support in focusing and refining the methodology for this study. His guidance opened my eyes to the richness of the text responses, which tell their own stories of years of experience in trying to transfer workplace training into changed behavior on the job.

I am deeply grateful to Dr. Patrick Kulesa, without whose ongoing support and encouragement, this study would not have been possible.

And I am deeply grateful to Dr. Lauren Artress, who has been my learning coach through this long and difficult process. Lauren kept my eyes on the goal and reminded me, in the long months of writing, never to let go of the hand of the reader.

Finally, and from the bottom of my heart, thank you to my Egg Harbor Family – Bernie and Kathy and Steve and Gary – for your enthusiasm and support every step of the way. To the two little dogs who never missed an opportunity to interrupt me in the middle of a thought, thanks to you as well. I discovered more insights than I can count at the dog park, beneath the winking double star in the constellation Auriga.

*"Any learner has a host of learning strategies at command. The salvation is in learning how to go about learning before getting irreversibly beyond the point of no return" (Jerome Bruner, 1985, p. 8).*

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# CHAPTER 1. INTRODUCTION

Workplace training is the context in which an organization's employees acquire the skills and knowledge they need to perform their jobs more effectively. Workplace training may take a variety of forms, including new employee orientation, apprenticeship, job sharing, online self-study and job aids, in addition to, or in place of, classroom programs conducted by subject matter experts. Everyone in the organization has a stake in the success of workplace training, from the leaders who allocate budgets and resources to develop and conduct the programs, to the employees who must apply what they learn to move their organizations forward.

The strategic importance of training outcomes is evident in the efforts in many organizations to measure the impact of training, for example, in improved customer satisfaction, or as a component of return on investment (Brinkerhoff, 2005). However, decades of research on the extent to which training investments correlate with changed behavior in the workplace, have yielded results that are, at best, mixed (Burke & Hutchins, 2007; Blume, Ford, Baldwin & Huang, 2010).

A survey of British learning professionals found that more than 70% doubt that training in their workplaces is effective (Murray & Efendioglu, 2007). Studies over two decades suggest that as little as 10% of training investments change behavior on the job (Grossman & Salas, 2011; Saks & Burke, 2012). Even measures of training effectiveness raise doubts, as a survey of industry executives (American Society for Training &

Development [ASTD], 2009) reported that three leaders in four doubt the ability of their evaluation programs to assess the effectiveness of their workplace training programs. Given the strategic importance of training in many sectors of the economy, widespread doubt about the effectiveness of workplace training should not be acceptable – to leaders, designers, instructors or learners.

A variety of approaches for improving training effectiveness have been tried. Results were improved in a flight training program during wartime, by prequalifying trainees based on skills and general physical abilities (Reiser, 2001). A comprehensive training evaluation model was developed in the late 1950s, measuring learners' reaction to training events, assessing what they learned, and measuring the impact of training on work behavior and business results (ASTD, 2009). Training design models based on hierarchies of tasks, and highly-prescriptive design sequences, have been applied and adapted and updated to improve workplace training.

Studies of training effectiveness suggest that there are important factors outside of the training event that influence effectiveness as much as the training itself (Blume et al, 2010). Learner motivation, the degree to which managers support training, and aspects of the work environment may be equally important in the complex process of transferring what is learned to the job (Noe, Tews, & Dachner, 2010).

The growing sophistication of the online learning environment increases the urgency of addressing training effectiveness, as learners gain control over when, how, and what they learn, but appear to lose the support of instructors; and designers struggle to account for learner attributes and technology constraints affecting a worldwide workforce (Groves, Rickelman, Cassarino, & Hall, 2012).

How can trainers and designers account for influences on training effectiveness that are beyond their control? And if they cannot, how can leaders, trainers, designers and learners gain confidence in the training programs in their workplace?

This study investigates the possibility of realigning roles in the overall process of workplace training, from "instruction" to "partnership", with all stakeholders as active participants in problem-solving and decision-making in design, and shared responsibility among designers, instructors and learners for training delivery. This type of partnership has been envisioned in emergent learning design models, as will be discussed in Chapter 2. However, the workplace challenge of involving learners – who are employees, with full-time jobs and little time available for a project as important as training design and delivery – has limited the application of design partnerships (Carr-Chellman, 2007; Groves et al., 2012).

This study uses a model through which it may be possible for learners to participate with designers and instructors, in all aspects of training design and delivery, through a medium of employee input that many organizations use regularly to assess the well-being of their workforce: the organizational survey.

## Background, Context and Theoretical Framework

Trainers and instructional designers have long been held responsible for training effectiveness, despite the obvious role of learners in transferring what they have learned to their day-to-day responsibilities. For much of the 20th century, instructors relied on the influential behaviorist model to elicit learning responses through stimulus-response-repetition-reinforcement (Skinner, 1950). Designers learned from Gagné (1962) that the

best way to improve training was to apply a systematic approach that broke tasks into smaller units which could be learned in sequence (Kraiger, 2008).

While designers and instructors are held accountable for training results, learners have nonetheless been involved in training design for decades. Walter Dick (1996) said of the widely-used Dick and Carey instructional design model, that although early versions were delivered without testing or evaluation, by the 1970s the model included evaluation points at key development milestones, when one or a few learners were invited to help identify and correct errors.

Donald Kirkpatrick's evaluation model grew out of his research in the 1950s to determine which of four types of evaluation was best to measure training effectiveness. Kirkpatrick (Kirkpatrick & Kirkpatrick, 2006) found that four levels of evaluation were necessary: learner reaction to training; performance assessment; evidence of changed behavior on the job, and evidence of training impact on business results. However, the four-level evaluation model is perceived to be ineffective (ASTD, 2009), in part because evaluating how well learners transfer training content to their jobs is notoriously difficult, since the training event is seldom the only influence on learning and changed behavior (Blume et al., 2010).

Training in the online environment disrupts the designer-and-trainer-led model, by shifting significant responsibility for conduct of the training event to learners (Sims & Stork, 2007). The online learning environment also disrupts most training design models by introducing ill-structured and "wicked" problems that elude traditional step-by-step instructional design (Irlbeck, Kays, Jones, & Sims, 2006), and with constantly changing requirements that throw development projects into disarray (Groves et al., 2012).

Evidence suggests that learners are aware of these problems in their experience of online training programs (Groves et al., 2012); the partnership described in this study enables learners to contribute important insights to help designers address the complexities and shifting requirements inherent in the online environment.

**Learners as partners in training effectiveness**

Training effectiveness requires the conscious effort of learners, to apply newly-acquired knowledge and skills in solving real-world problems (Pugh & Bergin, 2006). Learners thereby share in the responsibility for successful training programs, with designers, instructors and other stakeholders (Carr-Chellman, 2007; Noe et al., 2010). The importance of the learners' role is grounded in human cognition research (Bandura, 1997) and constructivist learning theories (Jonassen, Cernusca, & Ionas, 2007), which call for training contexts in which learners are engaged in active problem-solving, to build understanding, knowledge and skills. In the online learning environment, moreover, learners may find themselves responsible for much of the conduct of their training, as increasingly sophisticated learning technologies afford to learners substantial control over what, when and how they learn (Paas, Tuovinen, van Merriënboer, & Darabi, 2005; Sims & Stork, 2007).

## Introduction to the Problem

Given the substantial role of learners in transferring knowledge and skills from training to the job (Noe et al., 2010), efforts to improve workplace training should involve learners as well as designers and subject matter experts. While this supposition may appear obvious, training design models that involve learners as active participants in

design are recent (Carr-Chellman, 2007), influenced by increasingly sophisticated technology in a highly disruptive business environment.

More often, designers study learners during needs analysis, attempting to build a comprehensive profile of learner characteristics and training needs (Smith & Ragan, 2005; Rothwell & Kazanas, 2008). The needs analysis approach omits two elements that are important to the success of training design: first, by excluding learners from the crucial phases that shape design decisions, designers lose access to their direct experience of complex and "wicked" problems that are likely to emerge later in development, or worse, during training (Irlbeck et al., 2006; Groves et al., 2012). Second, excluding learners from training design misses the opportunity to gain their "buy-in" early in the process (Hardré, 2003; Carr-Chellman, 2007), which could positively influence their motivation to learn (Blume et al., 2010), and more important, their sense of ownership of the training program (Carr-Chellman, 2007). Social cognitive research shows that the experience of ownership of a program increases the likelihood that people will persevere to complete the program, and will feel a personal stake in its success (Bandura, 1997, 2001).

The online learning environment compounds the challenge to designers, as it exposes complex and ill-structured problems affecting design, development and delivery of training (Irlbeck et al., 2006). For example, the accessibility of online learning to anyone, anywhere, belies the reality that learners may be strongly influenced by cultural or other constraints that are unknown to the designers (Sims & Stork, 2007; Groves et al., 2012). Moreover, the online learning environment makes it possible to reimagine the nature of learners' interactions with instructors, training resources, and other learners

(Fogg, 2003; Sims & Stork, 2007), reframing the foundation of the design. Familiar step-by-step "systematic" instructional design models (Dick, Carey, & Carey, 2009) lack the flexibility to support creative redesign, or to detect and manage ill-structured and "wicked" problems inherent in the online environment that threaten the success of the design (Irlbeck et al., 2006; Groves et al., 2012).

Perhaps most challenging to designers is the global economic and social climate in which organizations of all kinds must operate. For much of the twentieth century, the pace of technological change seemed turbo-charged by innovation and expanding global markets. For the past several decades, however, the rate of technological change has accelerated, as systemic disruption in financial markets, violent cultural upheaval caused by political or social conflicts, and even the weather, have destabilized the environment in which nations, businesses and people live and work (Clark & Gottfredson, 2008).

In this era of ongoing disruptive change, operational models formerly thought to be the best way to run a business or a school become unsustainable, unless they are able to adapt to constantly changing conditions (Clark & Gottfredson, 2008). Organizations that once relied on hiring workers for their expertise now find that their employees' most valued attribute is their ability to adapt and learn, as the organizations where they work are transformed by rapid growth and change (Clark & Gottfredson, 2008). In this disruptive business and social climate, an organization's capacity for ongoing training and learning, affecting employees at all levels, is essential not only for growth, but for its survival.

"Systematic" training design methodologies are poorly suited to an environment of aggressive deadlines, sophisticated technologies, constantly changing requirements,

and complex, ill-structured problems such as those just described (Groves et al., 2012). To meet business needs, designers adapt strategies to speed design and revision cycles, and they incorporate more stakeholders at earlier points in training design (Groves et al., 2012). While designers may view this paradigm shift as a necessary response to the business environment (Groves et al., 2012), their adaptive design strategies also afford the opportunity to expand the role of learners as stakeholders in workplace training design, enabling more effective problem-solving during design phases, and increasing learners' perception of ownership of their training (Brinkerhoff, 2005; Carr-Chellman, 2007).

Limited expectations of learners' ability to contribute to the design process may constrain their participation, as "end-users" of training applications, much as end-users of financial and operations systems were historically excluded from design and development of their systems, because their participation was expected to be a distraction to the team (McKeen & Guirmaraes, 1997), while adding no value to system development (Barki & Hartwick, 1994). Training designers expect learners to notice errors, through milestone reviews and formative assessments (Dick, Carey, & Carey, 2009), and to provide evidence that justifies training budgets, or validates existing programs, through "smile sheet" ratings (Kirkpatrick & Kirkpatrick, 2006). While learners may have limited understanding of technical issues surrounding training design, this study will show that they have specific expertise that can help designers identify and solve the ill-structured and "wicked" problems that arise during design and development, especially in the online learning environment (Irlbeck et al., 2006; Groves et al., 2012).

However, employees as learners may find that the day-to-day responsibilities of their work limit their availability to participate on training design teams, with the result that one or a few employees are named to represent many others (Groves et al., 2012; Carr-Chellman, 2007). Is it reasonable for small numbers of employees to attempt to represent the experience and needs of many? For the complex problem-solving required in the online learning environment, (Irlbeck et al., 2006), how can employees participate in a meaningful way?

This study suggests that many organizations maintain a resource that could serve as a medium for learner participation in workplace training design: the organizational survey, in which all employees are invited to rate aspects of their work environment, and to suggest ways to improve working conditions. To the extent that employees use survey responses to discuss their experience as learners in workplace training programs, the organizational survey could enable many employees to participate directly in the design decisions that affect their training. Through rigorous analysis of survey responses, this study will explore the extent to which this data represents a viable source of input into workplace training design.

## Statement of the Problem

Although learners bear significant responsibility for training effectiveness, their role in designing workplace training programs is usually limited to reactive participation as evaluators, with potentially detrimental impacts both on their motivation to persevere in training programs, and in the quality of training program designs that would benefit from their insights to solve ill-structured problems. An approach is needed to incorporate input from learners in the design phase of workplace training programs, especially those

planned for the online learning environment, in which ill-structured and "wicked" problems are an ongoing design challenge (Irlbeck et al., 2006; Groves et al., 2012).

## Purpose of the Study

The purpose of this study is to investigate the potential of text responses to organizational surveys as input into the design of workplace training programs, especially for the online learning environment. To the extent that employees use survey responses to record their views about training programs at work, their responses could represent a useful source of input, in solving ill-structured problems, and making decisions that affect the design and improvement of workplace training programs.

## Research Questions

Text responses to organizational surveys offer two types of insights: first, the frequency with which certain themes are expressed, indicating the importance of those themes based on the number of responses that include them (Bishop & Kulesa, in Kraut, 2006); and second, specific insights and suggestions submitted by some respondents, which may be viable as input into the training design process. A mixed methods approach is required for this study, to analyze text responses from the top down, summarizing frequencies by theme, and from the bottom up, identifying particular responses that may be viable as input into workplace training design.

The overarching research question for this study frames the inquiry: *To what extent do text responses contained in organizational survey data represent viable employee/learner input into workplace training design?*

The research question for the top-down phase describes the results of quantitative analysis, which analyzes text responses across all industry sectors: *What are the most frequent themes relating to workplace training programs that appear in organizational survey text responses?*

Research questions for the bottom-up phase describe how text responses are explored within a subset of data chosen for its relevance to the study: *How do employees describe their current experience of online training in their workplace? What would employees change to improve online training programs in their workplace? What do employees describe as strengths / weaknesses of online training programs in their workplace?*

Through inductive analysis, and the final phase of the study, synthesis, text responses are aligned with learner characteristics, indigenous knowledge and learner attributes, in order to identify input that may be viable in the design of workplace training programs. The research question addressing the synthesis phase evaluates the degree to which organizational survey data may provide a medium for employees to participate in the design of their workplace training programs: *To what extent does employee feedback about workplace training meet the criteria of input into workplace training design?*

## Rationale, Relevance, and Significance

### Rationale for the study

As online training continues to expand its presence in the workplace (ASTD, 2012), training designers face growing challenges to improvise traditional methodologies to solve complex problems and meet changing business requirements (Irlbeck et al., 2006; Kraiger, 2008; Groves et al., 2012). Organizational demands for faster delivery of

training applications require rethinking of long-standing analysis, design and implementation strategies (Groves et al., 2012). Developments in learning theory, from constructivism to emergent learning theories, reposition learners as makers and shapers of learning, and at the same time, new technologies assign a greater role to learners in determining what and how they will learn (Sims & Stork, 2007; Kraiger, 2008).

While instructors and designers may find that their job assignments enable them to adapt to new roles, it is more difficult to find avenues through which learners can contribute to the design and implementation of workplace training programs (Pastore, Carr-Chellman, & Lohmann, 2011). In the workplace, learners are employees, perhaps hundreds or thousands, in one or many geographic locations, all charged with varying responsibilities for carrying out the day-to-day activities of the business. While it is well understood that assigning learners to design teams can improve the quality of online training programs and reduce overall delivery timelines (Groves et al., 2012), and perhaps more important, increase their commitment to successful implementation (Wooddell, 2009; Pastore et al., 2011), the challenge is to find an efficient, effective medium through which large numbers of employees can contribute their experience, ideas and suggestions to the design process.

This study will address something that has not been studied before: *To what extent do text responses to organizational surveys represent viable employee/learner input into workplace training design?*

This study suggests that organizational surveys may provide an effective medium for gathering input about workplace training programs from employees, based on four characteristics of how surveys are used:

1. Organizational surveys are widely accepted as a means of gathering employee views on a variety of topics (Wiley, 2010) from employee populations that are too large to study directly (Knapp & Mujtaba, 2010).

2. In recent years, the focus of organizational surveys has shifted from a general assessment of job satisfaction to identifying and delivering "actionable insights" (Church & Oliver, in Kraut, 2006, p. 107).

3. Surveys are often positioned as interventions, with employees encouraged to participate as agents of change, increasing the likelihood that employees will contribute valuable ideas and suggestions on one or more of a wide range of topics affecting their work experience (Borg & Zuell, 2012).

4. In text responses to open-ended prompts, survey respondents are more likely to address specific issues related to their job experience, such as compensation, benefits and training, than they are to discuss abstract concepts, such as the company's image or values (Borg & Zuell, 2012).

**Relevance of the study**

The study suggests an emergent design model in which learners are equal partners in collaboration with designers, instructors and subject matter experts. This model is expected to have particular relevance for online training design, which is considered a special case of instructional design because of the complex, ill-structured and "wicked" problems inherent in the online learning environment (Irlbeck et al., 2006; Becker, 2007). By identifying learner contributions to training design in terms of specific criteria – for example, learner characteristics, indigenous knowledge and learning strategies – the

study uses a reasonable methodology for evaluating input from organizational surveys for viability as input in workplace training design, and therefore, potentially a practical means of gathering learner input into design processes.

Applying the methodology demonstrated in this study may have a positive effect on employee motivation to learn (Saks & Burke, 2012), as learners see their survey input actively applied to improve workplace training programs. To the extent that learners gain a sense of "ownership" in workplace training (Bandura, 1997; Pastore et al., 2011; Saks & Burke, 2012), they are more likely to contribute to the success of the programs.

This study suggests incorporating learner input as expressed in organizational survey text responses into the decision-making processes of workplace training design, particularly for the online learning environment. The study uses a training design model in which learners are equal collaborators with designers and instructors and subject matter experts (Sims, 2008), and learner input reflects experience of the workplace, technology, and individual strategies for making sense of training content (Sims & Stork, 2007).

**Significance of the study**

Analysis of organizational survey data is usually limited to quantitative measurement of scaled responses to opinion items, in part because of the perceived cost, in time and resources, of analyzing text responses (Bazeley, 2008; Borg & Zuell, 2012). In their study of the overall tone of text responses to a survey conducted by a large company, Borg and Zuell (2012) state that there is not, to date, an academically rigorous methodology for analyzing very large text files. This study will apply a mixed methods

approach within a critical realist philosophical framework, to analyze text responses, with two goals:

1. To determine whether organizational surveys represent a viable source of employee input that can be incorporated into workplace training design.

2. To demonstrate a rigorous and efficient methodology for analyzing large survey datasets for qualitative as well as quantitative results.

If organizational survey responses provide an effective medium for employees to participate as learners in workplace training design, employees can indeed participate – in very large numbers – in the design and delivery of their workplace training programs, which may increase their experience of ownership in these programs (Pastore et al., 2011; Saks & Burke, 2012). More important, viable input from employees may include insights that help to solve ill-structured and "wicked" problems that are inherent, particularly in the online environment (Irlbeck et al., 2006). To the extent that organizational surveys provide a resource for solving such problems, the methodology demonstrated in this study can be adapted widely by organizations, using their own survey data to improve their workplace training programs.

## Nature of the Study

This study uses a **sequential complementary mixed methods study** (Greene, 2007) within the critical realist philosophical framework. The study is sequential because results of deductive (quantitative) and inductive (qualitative) phases provide input into subsequent phases, with the synthesis phase interpreting results of both previous phases. The study is complementary because deductive (quantitative) and inductive (qualitative)

methods provide different information about the same survey population, and the work of deductive analysis actually structures the data according to thematic subsets for inductive analysis (Onwuegbuzie & Combs, 2011).

The deductive (quantitative) phase subjects the text dataset to iterative analysis (Teddlie & Tashakkori, 2012) using the software application NVivo, which quantifies text data based on frequencies of key-words. Through iterative cycles, using increasingly extended key-word phrases presented in word trees, this phase identifies major themes occurring across all text responses, and isolates subsets of responses for further analysis, based on the prevalence of key-words of special interest in this study, such as online training.

Major themes developed in this phase are validated through triangulation (Greene, 2007), through which both deductive and inductive methods of analysis are applied to the same dataset to reduce the biases inherent in each method. The bias associated with deductive analysis of a very large dataset is over-generalization: inferring themes based on very high frequencies of key-words, while overlooking nuances that could change the meaning or intent of those key-words. The study offsets this bias by applying inductive thematic analysis, a close study of subsets of text responses, to identify themes in their entirety, within the specific context of individual text responses. Themes identified through close analysis are summarized by frequency, and by the frequency of specific key-words. This provides a basis for comparing the results of inductive analysis with the results of deductive analysis across all text responses, comparing the language and intent of themes identified through inductive analysis with the summarized themes and key-words found in deductive analysis. The validated results address the main quantitative

research question: *What are the most frequent themes relating to workplace training programs that appear in text responses contained in organizational survey data?*

The inductive (qualitative) phase involves deep analysis of subsets of text data chosen for their relevance to this study, through coding of text responses for themes and topics. This phase answers qualitative research questions: *How do employees describe their current experience of online training in their workplace? What would employees change to improve online training programs in their workplace? What do employees describe as strengths / weaknesses of online training programs in their workplace?*

The final phase of analysis synthesizes results of qualitative analysis, comparing the concepts, experiences and suggestions in text responses with criteria for learner input grouped as learner attributes, indigenous knowledge, and learning strategies. This phase addresses the final qualitative research question: *To what extent does employee feedback about online training meet the criteria of input into online training design?*

## Definition of Terms

For this study, the following terms are important:

1. *Comment* and *text response* are interchangeable terms describing an employee's written answer to a survey prompt, such as, "What one or two things would you change to most improve your work environment?" Respondents may use pencil-and-paper or online textboxes to write their responses, which may be of any length, on any topic or topics. Respondents may have the choice of self-selecting a category as the topic of their response but are not limited to that topic in the content of the response.

2. An *organizational survey* is a fifty-to-seventy question inventory of scaled opinion items, and prompted text responses, intended to gauge the working environment and degree of employees' engagement with their work. The survey is administered by a third-party provider skilled in organizational assessment and results analysis.
3. *Respondents* are individual employees of the organization conducting the survey, who submit text responses to organizational surveys.

## Assumptions, Limitations and Delimitations

The study makes the following assumptions:

1. Organizational survey data has been collected using a methodology with a sound basis in research, consistently applied in the administration of all surveys.
2. Survey respondents are challenged to be agents of change in recommending improvements to their work environment. A significant percentage of their responses will relate to their personal experience of workplace training.

The study may be affected by the following limitations and delimitations:

1. The dataset includes responses from 59 organizations in eighteen industry sectors, which may not reflect the experience of people working in other organizations or other sectors of the economy.
2. Respondents are not prompted to evaluate one or more training events, but rather to express their opinion about what would most improve their work experience. Comments they make about training reflect their personal outlook rather than a rigorous analysis of training in their workplace.

## Organization of the Remainder of the Study

Chapter 2 explains the expanded role for employees as learners suggested by this study in more detail, providing the theoretical context for expanding the role of learners in psychology and learning theory; discussing how learners are viewed in various training design models, and describing the impact of technological advances on training design. Emergent design models are discussed in the context of partnership between designers, learners, instructors and subject matter experts. Three models of learner attitudes and attributes provide a framework for identifying themes in organizational survey text responses, as the basis for conducting the synthesis phase of this study.

Chapter 3 presents the three-phase methodology applied in this study within the critical realist philosophical framework, showing how survey text responses are reasonably and thoroughly analyzed for the purpose of identifying input into workplace training design.

Chapter 4 presents the results of data analysis, and Chapter 5 summarizes the findings, presents conclusions and implications for practice, and recommends avenues for future research.

# CHAPTER 2. LITERATURE REVIEW

## Introduction to the Literature Review

Throughout the twentieth century, the role of learners was shaped and defined by cultural paradigms that influenced learning research and instructional design (Kraiger, 2008). The dominant paradigms for much of the century viewed learners as receptors of training, first as units on an educational assembly line, and later as processors analogous to computers (Reiser, 2001). In these paradigms, a learner could be viewed as a "black box," receiving and responding to training stimuli, through internal processes that were at best poorly understood (Skinner, 1950; Jonassen, 1991). Training programs could be improved by changing the stimuli, in the form of trainers, resources, or the design of the training event. Results of training might be measurable as learning, but even when training was successful, the reasons for success might be difficult to discern (Gagné, 1962; Gagné, Briggs, & Wager, 1992).

Cognitive research demonstrating, for example, that people learn by modeling the behavior of others, led to a broader understanding of how people learn, and to learning theories that recognize learners as active participants in learning (Jonassen, Cernusca, & Ionas, 2007). Learning within a social context, especially with increasingly sophisticated interactions between people and technology that are available online, further expanded the learner's role in training (Bandura, 2001; Fogg, 2003; Sims & Stork, 2007).

Three major paradigms that have broadly influenced training in the workplace are presented in this chapter: the assembly line, the information processing model, and the constructivist philosophical framework. Relevant theories and research are discussed for each paradigm, along with their impact on the role of learners as participants in training design. The partnership model described in this study is presented in the context of the constructivist philosophical framework.

## Theoretical Framework and Review of Research: Three Paradigms

### The assembly line model of "instruction"

For much of the twentieth century, the industrial assembly line represented the best way to do things, whether building cars or running schools or training workers. John Dewey (1938) observed that schools took as their mission the transmission of received knowledge to students, whose role was to accept and store information. Reigeluth (1996) characterizes this "industrial age" paradigm as bureaucratic, autocratic and adversarial, valuing conformity and compliance, and with the dark prospect of planned obsolescence and corporate leaders as "king" (p. 13).

The assembly line paradigm prizes efficiency, standardization and consistency. Quality is measured by how effectively content is designed and delivered (Jonassen et al., 2007). Gagné's (1962) "principles of learning" approach, for example, called on the teacher or designer "to arrange the external conditions in such a way that the desired performances will be acquired with the minimal expenditure of time, money and wasted effort" (p. 84). Learners were objects of education in this paradigm, passive recipients of skills and knowledge delivered in standard units, as preparation for their adult roles as workers (Kraiger, 2008). For example, the programmed instruction model developed in

the 1950s applied the behaviorist model of stimulus-response-repetition-reinforcement, delivering training material in small units, to be followed by immediate assessment and feedback (Reiser, 2001). Gagné's (1962) task analysis model broke "any human task" into components, to be taught in sequence, such that the final task is the culmination of the components (p. 88).

The common elements in these training models are, first, the central roles of the designer and instructor in creating and delivering training (Kraiger, 2008); second, the assumption that learning occurs following delivery of external stimuli, which evince desired responses from learners (Reiser, 2001); and third, that because the processes involved in learning are hidden, they cannot be measured (Skinner, 1950).

The behaviorist approach that dominates the assembly line paradigm (Reiser, 2001) rejects theories that attempt to account for mental processes such as learning that cannot be measured (Skinner, 1950). However, Francis (1975) documents the practical problem for teachers who must engage those mental processes in their students in order for learning to take place. Likewise, learners seeking to control their circumstances, so they can learn more effectively, are not accounted for in this paradigm, nor are the different contexts of learning that people engage in every day, such as solving complex problems, learning to play chess, or to sing, or to write poetry, or fundamentally, the behavior of babies as they acquire language (Bruner, 1985).

Francis (1975) describes this paradigm as "instruction," as opposed to "teaching" and "learning," which "implies that what occurs of consequence in the classroom is the teacher's active responsibility and that learning is something that is caused in students by the instructor" (p. 4). Some critics observe that the behaviorist model is largely based on

experimental evidence derived from studies of animals in highly controlled conditions (Francis, 1975; Bruner, 1985). Skinner's (1950) experimental research on the behavior of pigeons used hunger as an incentive, for example; the frustration of college professors is understandable as they attempt to motivate graduate students based on the response latency of hungry pigeons.

Gagné (1962) rejects the behaviorist framework as an inadequate representation of the way people learn, but his hierarchical task sequence delivered to passive learners fails to account for essential characteristics of all forms of learning, including attention, memory and motivation (Bruner, 1985). These attributes are obvious to teachers as they try to inspire students to take personal responsibility for their learning (Francis, 1975).

**Learner participation in training design in the assembly line paradigm.** In the assembly line model, learners participate in training design through one or more measures of training evaluation. While training evaluation might appear to provide an active form of participation in the training process, the purpose of evaluation is to support organizational training budgets and programs (Kirkpatrick & Kirkpatrick, 2006). For example, the first level of Kirkpatrick's four-level evaluation model gauges learners' reactions to training events in terms of customer satisfaction (Kirkpatrick & Kirkpatrick, 2006). End-of-training surveys invite learners to rate the trainer, training environment, materials and technology, with a text response prompting learners to explain their ratings or suggest program improvements.

Levels two, three and four evaluations are intended to be controlled experiments, with pre- and post-training assessments, and a comparison with assessments administered to a control group (Kirkpatrick & Kirkpatrick, 2006). Level two performance tests, used

to measure acquired knowledge or skills, or changed attitudes, are to be administered before and soon after the training event. Level three assessments of changed behavior on the job should be conducted as much as three to six months following training, to allow time for trainees to demonstrate changed behavior. Assessments are conducted through surveys or personal interviews with the trainee, and also with colleagues and managers, on the assumption that the trainee may not be the most reliable judge of whether behavior has changed. Level four measurement of the business impact of training likewise should occur no sooner than three to six months following training, and may vary depending on the subject matter. Increased sales may be an appropriate means of evaluating sales training, for example, as customer satisfaction may be the measure of training for call center representatives (Kirkpatrick & Kirkpatrick, 2006).

Levels three and four of the Kirkpatrick model demonstrate the importance of considering longer-term behavioral change as a measure of training effectiveness, but the effort required to conduct pre- and post-assessments for trainees and control groups may in part explain why these assessments are less frequently used. Moreover, the model fails to account for complex factors outside the training event that influence behavior change and the impact of training on business results (Bates, 2004).

In what Saks & Burke (2012) describe as the paradox of training evaluation, the assessments most likely to be used – levels one and two – have the weakest correlation to training effectiveness, while the assessments less frequently used – levels three and four – correlate well with training effectiveness (Blume, Ford, Baldwin, & Huang, 2010). An ASTD survey (2009) of training professionals reported that more than 90% conduct level one "smile sheet" evaluations, and more than 80% conduct level two performance

assessments, but only about half conduct level three assessments of changed behavior, and about one-third correlate training with a business impact.

**Factors that influence training transfer.** Transfer is the extent to which learning in a training program is generalized and maintained in an employee's work performance (Blume et al., 2010; Saks & Burke, 2012). As discussed, transfer includes a range of factors outside the training program, which can be categorized as learner attributes, such as ability, motivation and personality, and situational variables in the work environment, such as manager support and the degree to which changed behavior is recognized and rewarded (Saks & Burke, 2012).

Decades of research suggest mixed and inconclusive correlations between most of the identified learner, training and environmental factors and training transfer (Blume et al., 2010), which led Saks and Burke (2012) to question whether all relevant factors are being considered. The elusive quality of motivation was missing, as it often is in learning models which presume that learners are motivated to learn (Bruner, 1985; Hardré, 2003; Saks & Burke, 2012). Saks and Burke (2012) found that making learners aware that they were held accountable for transferring what they learned in training to their job changed learners' behavior – when they knew their performance was being measured, learners reported that their intention to transfer was stronger.

Pugh and Bergin (2006) suggest an influential role for learner motivation in transfer, which they describe as "active learning and deep level processing (including metacognitive activity)" (p. 148). Their observation, that "transfer increases when students are aware of what they know and do not know" (Pugh & Bergin, 2006, p. 148), supports the finding by Saks and Burke (2012) that learners are more likely to change

their behavior when they know they are being held accountable. Brinkerhoff (2005), whose "success case method" of evaluation incorporates training into the context of the whole organization, stresses the importance of "involving all the players: employees, training leaders, the line managers or learners, and senior leadership" (p. 88). As will be discussed, motivation is one of several factors available to learners to influence transfer of training. These examples show that learners are capable of bringing these factors to bear to make their training experiences more effective. Expanding the learners' role – by making them accountable for results, or by involving them in more of the process, as in the Brinkerhoff (2005) model – may be a way of activating one or more of these factors.

**The "systematic" model of information processing**

As computer-based systems became the preferred solution to business problems, in the 1970s and 1980s, an "information processing" model overlaid the assembly line as the best way to get things done. The inputs-process-outputs model preserves some values of the assembly line, such as consistency and efficiency, and adds storage capacity and speed, making it possible to carry out time-consuming, detailed functions involving massive amounts of data, quickly and more reliably than similar functions done by hand.

**The "systematic" model of instructional design: ISD / ADDIE.** The term "systematic" was used to describe models for training design as early as the 1960s, and by the end of the 1970s there were dozens of "systematic" instructional system design (ISD) models, used to develop military and industrial training programs (Reiser, 2001). Most follow the methodologies emerging in those decades for building automated business operations and financial systems: analysis, design, development, implementation and evaluation, from which the ADDIE nickname is derived (Gustafson

& Branch, 2002). Each step in the sequence generates input for the next step. Although there is some room for combining steps or conducting some steps concurrently, the sequence is essential to the reliability of the process (Gustafson & Branch, 2002).

In their survey of instructional systems design models, Gustafson and Branch (2002) rank the Dick and Carey (Dick, 1996) model as the standard against which other models are measured for large and moderately complex training development. In the most recent edition of their ISD textbook, Dick, Carey and Carey (2009) emphasize the model's adaptability to any training context, because "all purposeful teaching and learning" can be viewed "as systematic processes in which every component is crucial to successful learning" (p. 1). They warn against changing or omitting steps in the model, because "failure to account adequately for conditions within a single component can doom the entire instructional process" (Dick et al., 2009, p. 1). Although elsewhere in the text they observe that proficient designers are likely to adapt the process to meet circumstances, Dick et al. (2009) believe the strength of the model is that it is empirical and replicable; instructional designers can "trust the model" (p. 4).

**The learner's role in instructional system design.** As the "end-users" of instructional system designs, one or a few learners are invited to participate in evaluation tasks at key development milestones, although Dick, Carey and Carey (2009) observe that some designers deliver training programs that have not been evaluated. Engaging so few learners would seem to limit the value of the reviews; Dick et al. (2009) observe that "simply trying out materials with a single learner and revising the materials on the basis of that data can make a significant difference in the effectiveness of materials" (pp. 257-258).

Figure 1 Learner's role in the Dick & Carey (2009) model: Reaction / assessment

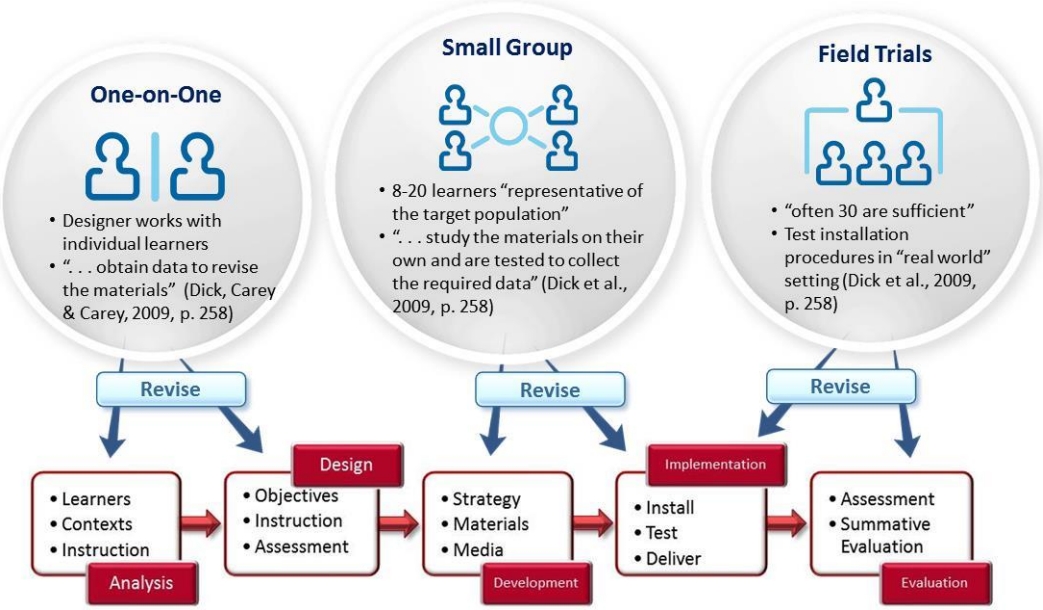



Figure 1 Model derived from *The Systematic Design of Instruction*, 7th ed., by W. Dick, L. Carey & J.O. Carey, 2009, pp. 256-257.

Figure 1 shows several evaluation strategies in the ISD process. The goal is for learners to "pinpoint specific errors in the materials in order to correct them" (Dick et al., 2009, p. 259). As in the assembly line paradigm, learner evaluations are meant to serve designers and instructors, with little thought of the impact increased participation might have on learner motivation.

**The information processing model and learning.** The information processing paradigm views the inputs-process-outputs model as comparable to the functions of the human brain, making it an attractive model for the kinds of "information processing" thought to occur in training (Reiser, 2001). The information processing model appears to acknowledge the human brain's problem-solving abilities, but learning processes occurring in the brain remain elusive, and the brain lacks the property of consciousness and the ability to take responsibility for its actions (Bandura, 2001). The learner

continues to be a "black box," as the information-processing brain receives and "somehow" processes inputs, generating outputs in the form of responses to prompts from teachers and materials (Gagné et al., 1992, p. 11). As in the assembly line paradigm, instructors are responsible for causing learning to occur, and improving training depends on better instructors and better programs.

**"Systematic" instructional design overtaken by the information age.** The step-by-step design approach has been challenged for many years as clumsy and time-consuming, so much so that Dick (1996) questioned whether the model would survive the decade of the 1990s. At the same time, Reigeluth (1996) observed that the nature of learning itself had become more complex, as the "industrial age" principle, that education serves the function of "sorting" learners based on their anticipated roles in the workforce, gave way to the information-age need for problem-solvers with sophisticated analytical skills (p. 14). Reigeluth (1996) called for a new paradigm that is team-based, rather than bureaucratic, emphasizing cooperation and shared decision-making; diversity and holism over conformity and compliance, and quality over planned obsolescence. The new paradigm would take into account the complex demands of the changing workplace, as well as a growing body of research that greatly expands our understanding of how people learn.

**Cognitive research and the nature of human learning.** As learning theorists questioned the information processing paradigm (Reigeluth, 1996), cognitive research that had begun in the 1960s showed how people learn from prior experience, by imitating models, and by comparing the problem in front of them with others they have successfully solved (Bandura, Ross, & Ross, 1961; Bruner, 1964). Cognitive researchers

dismissed the behaviorist view that people "are merely repositories for past stimulus inputs and conduits for external stimulation" as limiting our understanding of human learning too much (Bandura, 1997, p. 9). According to Bruner (1965), "At the very first breath, the young learner should, we think, be given the chance to solve problems, to conjecture, to quarrel as these are done at the heart of the discipline" (p. 1013).

**Social cognitive theory and human agency.** Studies in the 1960s that observed learned aggressiveness in children challenged behaviorist theories by demonstrating that people learn by imitating models, and that even small children choose whether and when to act on what they observe (Bandura, Ross, & Ross, 1961). Bandura (2001), who led the studies, observes that "people are not just onlooking hosts of internal mechanisms orchestrated by environmental events. They are agents of experiences rather than simply undergoers of experiences" (p. 4). Social cognitive theory places learning in a social context, but emphasizes the importance of personal belief systems in shaping how people learn. People are self-organizing and self-regulating; they are capable of reflecting on their beliefs and actions, and they experience self-efficacy, the expectation that their efforts can lead to a positive outcome (Bandura, 2001). The belief that a person can take action to produce a desired result is "a key factor in how people construct and live their lives" (Bandura, 1997, p. 3).

An example of how human agency is supported by, and can support, self-efficacy is shown in the formative assessment model (Black & Wiliam, 1998), in which teachers and learners share responsibility for the interaction between them. In this model, both the teacher and learner take action that leads to a positive outcome. The experience may be familiar to the teacher, but for many learners, the perception of agency in "owning" their

role may be as important in supporting their sense of self-efficacy as the subject matter they are learning through the interaction.

**Human agency in formative assessment (Black & Wiliam, 1998).** In their study of classroom interactions, Black and Wiliam (1998) found that when teachers and learners take responsibility for their interaction with each other, both teaching and learning improve.

The formative assessment model (Black & Wiliam, 2009) posits an interaction broken from both sides. As shown in Figure 2, what the teacher thought was being communicated can be confused by what learners thought they were meant to learn. Confusion in the learner can result in a response that surprises the teacher, leading to a teacher's responses that surprises – and potentially upsets – the learner.

Figure 2 The broken interaction between teachers and learners

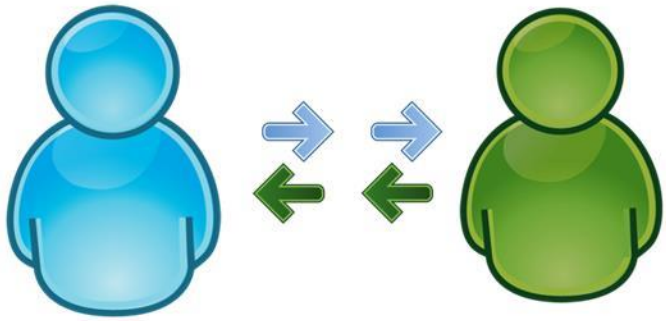


Figure 2 The model shows multiple points of broken communication between teachers and learners. What the teacher meant to convey is not necessarily what the learner hears and understands, and the learner's response may then be unexpected, resulting in a response the learner doesn't expect from the teacher. Interpretation of description in "Developing the theory of formative assessment," by P. Black and D. Wiliam, 2009, *Educational Assessment, Evaluation and Accountability, 21* (1), 5-31.

The formative assessment model requires both teacher and learner to continually self-assess their role in the interaction: "What can I do to communicate this lesson more

effectively?" or "What do I need in order to understand this lesson better?" In both cases the goal is improvement, so the interaction is constantly evolving from both sides.

Black and Wiliam (2010) find that formative assessment is effective in virtually every setting where it is tried. When both participants act on their self-assessment, by presenting information differently, or by asking for help in learning, the interaction is strengthened and both teaching and learning improve (Black & Wiliam, 1998).

**Self-efficacy online.** The human capacity for adapting to change is severely tested by the "rapidly evolving cyberworld" that "transcends time, distance, place, and national borders, and alters our conceptions of them" (Bandura, 1997, p. 2). The perception of self-efficacy in the online environment is linked to persistence and self-regulation, essential traits in coping with sophisticated technologies in the workplace, where time pressure may be intense and the tolerance for trial and error may be low. Pressure on employees to acquire new skills and adapt to complex technologies places new – and changing – demands on workplace training, not only to meet training requirements, but to support employees in building learning skills, in effect, helping them to develop self-efficacy (Bandura, 1997).

Human agency is not a factor in the assembly line and information processing paradigms, which view learners as passive in training events, and reactive in training design. However, Bandura's (2001) assessment, that the technology environment of more than a decade ago represented a significant burden on people's perception of their ability to produce an outcome, is a warning for the far more complex technology environment today.

Reigeluth's (1996) call for a new learning paradigm that accounts for the complex problems of the workplace is reinforced by Bandura's (2001) observations, that people's perception of their ability to influence the direction of their lives is destabilized in a rapidly-changing technological environment. Although ISD models such as Dick and Carey's (Dick et al., 2009) continue to be adapted to meet requirements, new design models emphasize the skills and expertise of designers, and the importance of collaboration with stakeholders in solving complex design problems. Table 1 compares design models used as examples of the three cultural paradigms discussed in this chapter. As shown, theories of learning are often reflected in the design approach, with behaviorist models relying on prescriptive step-by-step sequences, while constructivist models are based on iterative design cycles and involve collaboration among all stakeholders in workplace training. Constructivist models have emerged in the past two decades, drawing on a new philosophical paradigm that realigns responsibility for learning from designers and instructors to learners.

**The constructivist philosophical framework**

The constructivist philosophical framework understands the world as "made" – constructed by the human mind, based on acquired understanding of universal rules and assumptions – rather than "found" (Bruner, 1985, p. 6). Within this framework, learning is the exercise of applying those rules and assumptions to instances (Bruner, 1985). The learner is "self-propelled" in balancing acquired experience within a universal framework (Bruner, 1985, p. 7).

The many learning theories and models within the constructivist philosophical framework (Jonassen et al., 2007) reflect the following assumptions about teaching and

learning: first, that learning is carried out by learners, who construct understanding through interaction with teachers, resources and peers; second, that learning is "situated in activity"; and third, that instruction should support learners in building understanding rather than transmitting received knowledge (Duffy & Cunningham, 1996, p. 5). Models within the constructivist framework "create learning situations" that encourage practice, simulations and problem-solving; it is "the active struggling by the learner with issues" in these contexts that "*is* learning" (Duffy & Cunningham, 1996, p. 5).

It is important to emphasize that constructivist learning models are not utopian ideals, but rather, real-world attempts to account for the way people experience and learn about the world. If the goal of learning is to embrace a new understanding of the world as the basis for changing behavior, learning models must support learners in using their own strategies to build that understanding (Duffy & Cunningham, 1996).

**Constructivist learning models and problem-solving.** Constructivist learning models apply problem-solving strategies to support construction of understanding, using authentic tasks and hands-on practice (Jonassen et al., 2007). The challenge for designers is that problems are not uniform, or of consistent complexity, and therefore all problems cannot be solved the same way (Jonassen, 2000). Moreover, the problems people confront in their daily lives and in their work are not the recognizable "story" type found on achievement tests, but rather the ill-structured types of problems that can be difficult to define and more difficult to resolve (Jonassen, 2000). Such problems are antithetical to most instructional design models that assume a well-structured sequence of problem-solving steps – both in the design and in the learning experience (Jonassen, 2000). The constructivist challenge to instructional design is to create real-world problem-solving

contexts in which learners can develop strategies for identifying and analyzing ill-structured problems.

As Bandura's (2001) forecast is realized in a world of disruptive technological change, ill-structured problems challenge the foundations of workplace training. Layers of rapidly changing technologies greatly increase the complexity of training design, at the same time the designs themselves are challenged to build problem-solving skills in the context of the real-world, ill-structured problems learners face. For some designers, the field of instructional design has itself become an ill-structured problem (Becker, 2007). To understand the design models that have emerged in recent years, it is important to understand the nature of ill-structured – and "wicked" – problems designers confront.

**Ill-structured and "wicked" problems.** Designers working in the online learning environment describe problems of design and technology as ill-structured, "wicked," and stubbornly resistant to classical problem-solving approaches such as the Dick and Carey (Dick, 1996) model (Irlbeck, Kays, Jones, & Sims, 2006). Ill-structured problems are difficult to resolve because there is lack of consensus – even uncertainty – regarding solutions (Becker, 2007). "Wicked" problems are more difficult yet, often unidentifiable as problems except in the context of solving them, and with few, or even no satisfactory solutions (Rittel & Webber, 1973).

"Wicked" problems were first identified in the context of city planning, where they take the form of intractable social issues, such as where to locate a highway, or how to renovate a neighborhood (Rittel & Webber, 1973). Rittel and Webber (1973) contrast "wicked" problems with classic problem-solving approaches that assume a phased, step-by-step process similar to the "systematic" model of training design, in which problems

are identified, analyzed and solved. In social planning, the classic approach fails even to identify the "wicked" problems that will inevitably confound the project.

A "wicked" problem cannot simply be analyzed and solved because it is generally not recognizable as a problem. The problem gradually takes shape and alternatives begin to appear through a process of discussion and argument among as many as possible of the people likely to be affected by the outcome (Rittel & Webber, 1973). Collaboration is essential because there is usually only one opportunity to solve a "wicked" problem, and there are no right or wrong answers to choose from – only better or worse alternatives. Planners do not have a second chance to build a highway, for example. There is only the best available plan, based on as much agreement as possible among those who want the highway – or acceptance by those who will be displaced – given the probably incomplete information available at the time (Rittel & Webber, 1973). The problem of how and where to build the highway takes shape as participants grapple with alternatives, coming to terms with who benefits from the new road; which neighborhoods will be displaced; how the investment will be managed, and how the region will be affected by traffic.

Becker (2007) posits that instructional design is by its nature a "wicked" design problem, drawing on the influential work of Schön (1983), who argued that step-by-step models do not represent the real-world design approach of experienced practitioners, who are more likely to view design as instances of problem-solving based on intuition and experience. To the extent that the expertise of designers is more effective in problem-solving than prescriptive tasks in a step-by-step model (Silber & Foshay, 2010), instructional design has more in common with the design professions, such as architecture (Kays & Francis, 2004; Becker, 2007).

**Adapting ISD / ADDIE to solve ill-structured and "wicked" problems at IBM.** Ill-structured and "wicked" design problems are inherent in the online learning environment (Irlbeck et al., 2006). One example of a design team that struggled with "wicked" problems in online training design was reported by IBM (Groves et al., 2012). With a lead-time of three weeks, IBM designers were challenged to create an online training program for employees stationed around the world, some of whom did not have access to standard learning platforms. Ongoing product innovations meant constantly shifting requirements; moreover, the workforce itself was evolving, both in numbers and locations, reflecting unfamiliar cultural contexts and learner expectations (Groves et al., 2012). While learners needed the flexibility of online learning, many expressed frustration at losing person-to-person contact with instructors, and at the difficulty of finding time and technology for training (Groves et al., 2012).

As the IBM training design team discovered, the flexibility of online learning to be available to learners anytime, anywhere has the unexpected complexity of presenting training expectations that may conflict with the cultural expectations of learners in other parts of the world (Sims & Stork, 2007; Groves et al., 2012). The online environment affords much more control to learners for choosing when, how and what they will learn (Sims & Stork, 2007), but it also disrupts interactions between learners and instructors, and between learners and their peers, creating a sense of isolation and disengagement for some learners, another type of "wicked" problem for designers.

Sims (2008) points out that reimagining the learning interaction should be an advantage, as learning technologies enable interactions that more closely resemble the persuasive technology of Facebook "apps" (Fogg, 2008) than the instructional focus of

traditional lessons. However, the advantage is neutralized by the inability of step-by-step design models to support complex problem-solving.

The IBM designers adapted a form of iterative design that involved collaboration with learners "to co-create learning experiences" (Groves et al., 2012, p. 48), an approach similar to the social planning model of discussion-and-argument collaboration proposed by Rittel and Webber (1973). In both examples, design teams were better able to solve problems through collaboration with all stakeholders, including "end users" – learners at IBM, and in the social planning example, people affected by a hypothetical highway (Rittel & Webber, 1973).

Faced with similar challenges for fast turnaround on an instructional design, Jones and Richey (2000) applied a rapid prototyping model, in which designers quickly create designs or prototypes that clients can review, or test, early in the process. They found that clients valued their direct involvement, and made useful contributions to the design using their knowledge of the work environment (Jones & Richey, 2000). Collaboration with clients early in the process also reduced costs, as changes that might otherwise appear late in development were addressed early, when they were less costly to resolve (Jones & Richey, 2000).

As these examples demonstrate, instructional designers have struggled to adapt "systematic" design models to the time constraints and increasingly complex problems they face. As shown in Table 1, design strategies developed over the past decade have emphasized problem-solving, a multi-disciplinary approach, and collaboration with stakeholders in iterative design cycles, to solve ill-structured and "wicked" problems, and

to take better advantage of increasingly sophisticated learning technologies, especially in the online learning environment (Kays & Francis, 2004; Becker, 2007).

**Table 1 Comparison of Training Design Models in Three Paradigms**

| Cultural Paradigm | Model / Designer | Learning Paradigm | Design Approach | Learner's Role in Design |
|---|---|---|---|---|
| Assembly Line | Programmed Instruction / Programmed Learning (Skinner, 1958) | Behaviorist | Training in small units, immediate feedback / assessment | N/A – Recipient of learning caused by designer / instructor |
| Assembly Line | Task Analysis (Gagné, 1962) | Behaviorist | Task broken into hierarchy of subtasks which are taught sequentially | N/A – Recipient of learning caused by designer / instructor |
| Information Processing | ISD / ADDIE (Dick & Carey, 1996) | Behaviorist | Step-by-step prescriptive sequence | Evaluation / assessment at development milestones |
| Information Processing | R2D2 (Willis, 1995) | Constructivist | Recursive, reflective: iterative design cycles involving collaboration of all stakeholders | Participative: stakeholder collaborating in design |
| Information Processing | Formative Assessment (Black & Wiliam, 1998) | Constructivist | Focus on interaction; teacher and learner continually self-assess their participation in the interaction between them, for the purpose of improvement | Learner shares responsibility for the quality of the interaction, active self-assessment and improvement |
| Information Processing | Rapid Prototyping (Jones & Richey, 2000) | Constructivist | Iterative design cycles in collaboration with client | N/A – client "ownership" through participation / contributions in iterative design cycles |
| Information Processing | Agile instructional design (Groves, Rickelman, Cassarino & Hall, 2012) | Constructivist | Rapid prototyping – iterative design cycles in collaboration with business partners and learners | One or a few learners testing prototypes |
| Constructivist Framework | Three-phase design (3PD) (Sims & Jones, 2002) | Constructivist | 3-phase interactive, recursive design fueled by knowledge sharing "communities of practice" that build understanding of the training context (course) over time | Tryout learners participate in testing prototypes; roles of designer, instructor and learner become interchangeable in proactive evaluation |
| Constructivist Framework | User Design (Carr-Chellman, 2007) | Constructivist | End users conduct every phase of design and development; "emerging dynamic systems theories" (Carr-Chellman, 2007, p. 109) | "Open, fluid, iterative process engaged in by whole communities" (Carr-Chellman, 2007, p. 53). Learners as end users "own" the system they design and develop |
| Constructivist Framework | Emergent online learning design (Kays, 2003; Kays & Sims, 2006) | Constructivist / Emergent | Design studio model, "highly interactive and student-centered . . . Creative and expert thinkers and self-regulated problem solvers" (Kays, 2003, pp. 127-128) | Collaborative, learners as experts participating in collective solutions to complex and ill-structured problems |
| Constructivist Framework | Emergent training design partnership (Warren, 2014) | Constructivist / Emergent | Design studio model, problem-solving collaboration of designer, instructor, learners, contributing perspective and expertise | Learners are change agents, contribute to problem-solving and design decisions through text responses to organizational surveys |

**R2D2: Iterative design is recursive and reflective (Willis, 1995).** When Dick (1996) questioned whether the Dick and Carey (1996) instructional system design model

would survive the decade of the 1990s, it was in the context of comparing that model with the Willis (1995) Recursive, Reflective, Define / Design / Development and Dissemination (R2D2) model. It should be noted that the question may have been rhetorical. Dick (1996) dismissed the R2D2 model as essentially similar in structure to ISD, and where it was different, he found the Willis (1995) model deficient.

The model is founded on the infinite triangle, meant to show the interactive and recursive nature of the three phases of definition, design and development, and dissemination. Stakeholders participate in all aspects of design, with the three phases intended as focal points for collaboration (Willis, Jost, & Mumma, 1999).

The R2D2 model attempts to resolve the fundamental problem not raised by Dick (1996): that the prescriptive nature of the step-by-step model renders it unable to identify and manage complex problems associated with sophisticated learning technology. Like the social planning model of complex problem-solving (Rittel & Webber, 1973), R2D2 relies on participation of stakeholders, bringing their practical knowledge of the design in the context of their experience, to solve ill-structured and "wicked" problems of design (Willis et al., 1999).

R2D2 draws its confidence in the problem-solving abilities of stakeholders on the work of Schön (1983), who argued that the expertise and experience of designers is of greater value than a prescriptive process in solving the complex problems arising in the design professions. R2D2 uses iterative prototyping, in collaboration with end users, in a collective effort through which a design emerges that would be impossible for any one of the participants to create alone (Willis et al., 1999, p. 1490).

In explaining the R2D2 model, Willis (2009) contrasts its characteristics with information processing models. The comparison shows the shift in focus, from prescriptive step-by-step design processes, to collaborative models of problem-solving, driven by the complex technology, workplace and training needs arising in the constructivist framework.

**The three-phase design (3PD) model (Sims & Jones, 2002).** The three-phase design (3PD) model (Sims & Jones, 2002) was developed in response to challenges facing university faculties trying to incorporate online technologies into their course designs. Some lacked the background and experience to make best use of online learning strategies, and others lacked time for thoughtful course design. The design solution was to build a stronger collaboration between designers and faculty, through phases of design structured by proactive evaluation, in which the design team organizes their work based on the evaluation criteria by which it will be judged (Sims, Dobbs, & Hand, 2001). Proactive evaluation enables early identification of design considerations that may only become clear through frequent trial and evaluation by faculty and learners.

The model emerged not only out of concern for the quality and utility of course designs in the relatively new online environment, but also to enable a design process that takes into account the rich potential of the environment (Sims et al., 2001). Even with the comparatively limited online environment available more than a decade ago, it was already clear that online learning offered new possibilities for interactions between learners and their teachers, peers and learning resources. The intent of the model was to enable a rethinking of learning goals and the best way to achieve them in the online environment (Sims et al., 2001).

The three phases are built around a project, which corresponds to a course. The first phase is pre-delivery, in which course components are built in concept or prototype; the second phase involves initial delivery and enhancement through proactive evaluation, and the third phase is ongoing delivery and maintenance based on feedback from teachers and learners. The model uses rapid prototyping, similar to the model described by Jones and Richey (2000), allowing for frequent evaluation points based on conceptual designs or working prototypes.

Proactive evaluation in the 3PD model occurs in the second phase iterations of evaluation, elaboration and enhancement, through which designers, teachers and learners collaborate to refine and complete course components.

Sims & Jones (2002) emphasize that the process does not drive the model; on the contrary, the needs of the project – the course – drive the make-up of teams who build, test and deliver course components. Teams are meant to stay in place over several iteration cycles, which could correspond to semesters, building shared knowledge of the project as they build, test and deliver course materials.

**The user design model (Carr-Chellman, 2007).** The user design model assigns the full responsibility for design and development of learning systems to the stakeholders who will use it (Carr-Chellman & Savoy, in Jonassen, 2004). Evidence for the success of this model is anecdotal (Carr-Chellman, 2007; Pastore, Carr-Chellman, & Lohmann, 2011), because it was found to be so time-consuming and difficult to implement that there is little to no research beyond case studies. The model addresses important issues in learning design, however, and its emphasis on end-user involvement as the solution deserves consideration.

User design has been applied to integrate organizational change in a school system and a healthcare training context (Pastore et al., 2011). The goal in both cases was to increase the success of the intervention by gaining the "buy-in" of those most affected, by involving them directly in decisions affecting the design (Carr-Chellman & Savoy, 2004). While Carr-Chellman and Savoy (in Jonassen, 2004) view the major obstacles to successful user design in terms of power relationships between end-users and those in authority, the major obstacle in the workplace is likely to be logistical. Employees who are the end-users of workplace training have full work schedules, with little, if any time available for the significant effort needed, not only to design their own training systems, but to acquire the designers' skills and experience to be successful.

User design resembles the collaboration of social planners (Rittel & Webber, 1973), in which all stakeholders work together to find consensus on ill-structured and "wicked" problems. As Carr-Chellman (2007) observes, to the extent that this model is possible, empowering end-users as "owners" of their training is a worthy objective toward the goal of improving training effectiveness.

**Emergent design: Collective activity to solve ill-structured problems.** Emergence is a complex property of collective activity that is not reducible to the behavior of any single entity in the collective (Johnson, 2001). The "generative, creative, proactive, and reflective" behaviors of the human mind that we call consciousness, for example, are emergent properties of the brain (Bandura, 2001, p. 4). The most important characteristic of the collective is that there is no executive function or "pacemaker" – all activities are the result of individual entities acting through their own logic (Kays & Sims, 2006). The collective is self-organizing and adaptive; through the bottom-up

activities of its entities it builds wisdom over time, through collective response to changes in the environment (Kays & Sims, 2006, p. 410). This emergent outcome is not something individual entities could have planned, or perhaps even imagined, on their own. Emergence is evidence of adaptive wisdom, gained through collectively solving problems encountered in the environment (Johnson, 2001).

The behavior of ants constructing colonies, or, among human populations, of neighborhoods forming along cultural or social lines, are examples of complex, adaptive behavior that emerges from individuals in a collective who are "following local rules" (Johnson, 2001, p. 19). Two examples follow of learning design models structured so as to produce emergent outcomes, by empowering individual entities in the collective to contribute based on their unique perspective and expertise.

**The studio model (Kays, 2003).** The studio model of emergent design views the online learning environment as a special case of instructional design, sharing attributes with design professions, such as architecture, in its orientation toward complex problem-solving (Kays & Sims, 2006). The studio model views individuals in the collective as artists, each bringing energy, talent and experience to the collective (Kays, 2003).

The activities of the collective generate a studio environment, a self-adjusting system in which creative individuals collaborate in a state of unstable equilibrium, as they identify and seek to define ill-structured problems in the online learning environment (Kays, 2003). The studio environment encourages "think[ing] about learning in the online environment rather than simply how to design instruction" (Kays, 2003, p. 127). As shown in Figure 3, individuals in the collective maintain their uniqueness, the "local

rules" of their orbits in the studio environment (Johnson, 2001, p. 19), while at the same time their activities are bound through their collaboration with the collective.

Figure 3 The studio model of emergent design

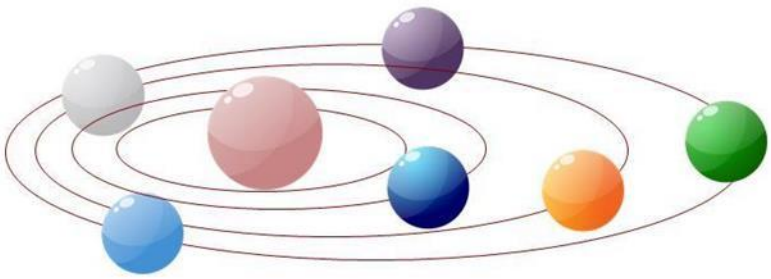


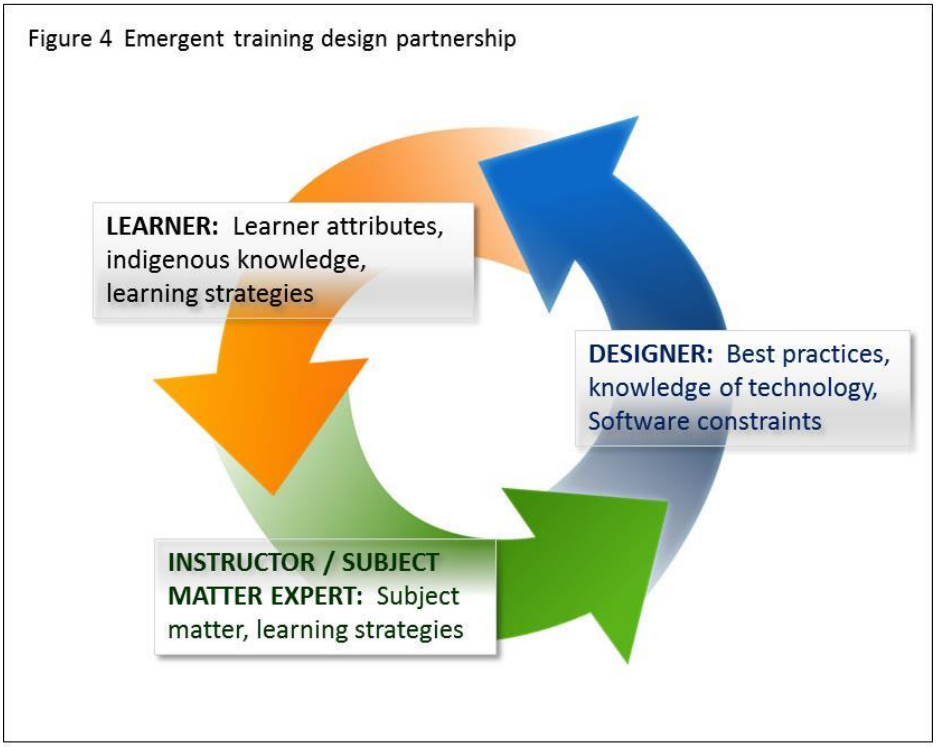
Figure 3 The studio model views each participant as an artist bringing particular talents and perspective. Collaboration has the potential to create emergent design, a new outcome of the collective effort that is not reducible to the contribution of any one participant.

**Emergent design: Partnership in problem-solving.** The model suggested in this study draws on several of the models discussed in this chapter, to create a partnership for workplace training design, in which learners are able to contribute directly in solving the complex problems inherent in the online training environment. The studio model (Kays, 2003; Kays & Sims, 2006) provides a context in which individual creativity is valued, and members of the collective are empowered to contribute based on their "local rules" (Johnson, 2001, p. 19) – the individual experiences of designers, instructors and learners about training in their workplace, particularly in the online environment.

The design process in this model uses rapid prototyping (Willis, 1995; Jones & Richey, 2000; Sims & Jones, 2002), to create working prototypes that can be tested and refined by members of the collective as an aspect of complex problem-solving. Figure 4

illustrates how learners share equally with designers and instructors, in the problem-solving activities of the collective, bringing to bear their "local rules" (Johnson, 2001) – their personal experience, indigenous knowledge of the work environment, and learning strategies – as elements of the emergent design (Kays & Sims, 2006).

Figure 4 Emergent training design partnership




Through their experience of partnership in decision-making, learners acquire the perception of "ownership" of training programs they help to design, and at the same time, their experience of learning is enriched. As Kays and Sims (2006) observe, the essence of the model is in creating an online training environment in which learners "are able to establish complexity in terms of their individual interactions" with each other, instructors, and learning materials (Kays & Sims, 2006, p. 411). The model supports collective

construction of this creative training environment, by empowering learners as co-creators of the design.

The model addresses the challenge of involving as many learners as possible in the collective – rather than one or a few individuals – through a medium that is widely used as an intervention intended to generate improvements in the work environment: the organizational survey. All employees are invited to respond to the survey as agents of change, a role that encourages them to address concerns directly affecting their work experience. The model envisions learner input as feedback into the collective, where it "creates structure, growth, and fosters higher level learning" (Irlbeck et al., 2006, p. 178) that can be integrated with other activities of the collective in solving online training design problems. Feedback can again be incorporated in iterations of rapid prototyping, to refine working models of training programs (Sims & Jones, 2002).

**Synthesis of research findings**

Creators of new models of training design for the online environment do not act solely out of inspiration. As discussed in this chapter, the complex, ill-structured and "wicked" problems arising in the online environment leave designers struggling to adapt inflexible, step-by-step methodologies. Moreover, interactions between learners and instructors, resources and peers are re-imagined in the online environment, as learners become "user-designers" (Reigeluth, 1996), personalizing online training programs to create a learning environment best suited to their needs. The blurring of roles, as learners control their environment and interact in new ways with instructors, resources and peers, presents an opportunity for designers to set aside hierarchical teaching and learning

models and build a new framework for teaching and learning supported by online technology (Beldarrain, 2008).

The constructivist and emergent models presented as examples in this study have characteristics in common that demonstrate the complexity and difficulties of designing online training programs.

First, their approach is problem-solving, rather than prescriptive; designers frame their models to embrace the unexpected, and continually changing, business requirements and technical complexities that are the direct experience of designers in the workplace (Groves et al., 2012).

Second, their approach is collaborative; none of these models imagines a designer able to solve all the problems without direct input from stakeholders, such as instructors and learners. Third, most incorporate iterative design cycles such as rapid prototyping, in which working models are produced early in the process to provide a basis for practical feedback, refinement, and testing.

The model used in this study draws on the strengths of the constructivist and emergent models discussed in this chapter, adding a medium through which employees as learners can participate in large numbers in the design of workplace training programs.

## Review of Methodological Literature and Issues

The methodology in this study uses text responses in organizational surveys as a source of input from learners about their workplace training programs. Surveys are a widely-used medium of gathering feedback about an organization's performance and culture (Wiley, 2010), meeting the practical need of soliciting input from populations that

are too large to study directly (Knapp & Mujtaba, 2010), populations that represent their organizations' best asset: employees (Kennedy, 1991).

Since the mid-1990s, employee surveys have been tailored to address specific business practices and policies (Schneider, Ashworth, Higgs, & Carr, 1996). Acting as a "virtual focus group" (Kulesa & Bishop, in Kraut, 2006), employee survey responses on topics such as leadership, career development, pay and training provide a reliable means of assessing working conditions and employee attitudes (Schneider et al., 1996). Evidence that external observations of workplace conditions corroborate employee survey assessments of the same conditions validates survey responses as a resource for decision-making (Schneider et al., 1996).

Church and Oliver (in Kraut, 2006) describe these as "actionable insights," input to be used as the basis for organizational change. When employees are invited to respond to surveys focused on particular business issues, they are often encouraged to be agents of change, with the understanding that their input will be taken into account in setting organizational priorities (Church & Oliver, in Kraut, 2006).

Text responses provide a particularly rich source of input, for two reasons. First is the prompt, which most often invites suggestions: "What one or two changes would most improve your work experience?" While there are several variations, it is a survey best practice to ask for suggestions rather than prompting for "any other comment you might have." Evidence is that respondents take the opportunity to discuss aspects of the work environment that directly affect them, rather than abstract issues such as the image of the company or its corporate strategy (Borg & Zuell, 2012). The second reason text responses represent a rich source of input is that respondents are encouraged to write as

much as they wish, about one or more topics. Given the likelihood that they will address concerns specific to their work experience (Borg & Zuell, 2012), text responses are likely to contain detailed information regarding workplace programs, such as training.

To the extent that employee survey responses are analyzed as input for program improvement, several positive outcomes are possible. First, employees have evidence that their input is valued, an ongoing challenge for survey administrators who continue to report a lack of follow-up on survey results (Wiley, 2012). Second, employees perceive "ownership" of programs that are improved by their input, which affects their sense of self-efficacy (Bandura, 2001), which further improves those programs as employees are motivated to make them work.

Third, those who design and manage workplace programs have an authentic source of input representing a significant portion of the employee population, containing reliable data that discusses in detail how the program affects the day-to-day experience of individual employees (Wiley, 2012). Ultimately, this is the goal of the present study: to provide a medium through which employees participate in the normal course of business, and through which they can contribute directly to the design of their training programs.

**Text responses about workplace training:** ***What will they say?*** This study emphasizes the central role of the learner in transferring what is learned in training to the job. The learner's motivation to learn, supported by cognitive traits such as self-efficacy and agency, appear to be essential for transfer, and research shows that these traits can be activated through external stimulus, such as recognition or accountability (Saks & Burke, 2012). The methodology used in this study supports recognition of learners' ideas and suggestions, by taking them into account in designing or improving workplace training.

Learners' text responses are categorized according to their content, so their ideas and suggestions can be incorporated into the work of designing or improving training programs. The structure for coding responses is not determined in advance, but rather emerges through the process of analysis. However, it is possible to anticipate general categories of responses, based on research about the influences learners experience in transferring training to their jobs.

Research identifies three major types of influence on training transfer: learner characteristics, training design, and situational variables in the workplace environment (Blume et al., 2010). Analysis of the training models discussed in this chapter suggests that learner characteristics and situational variables can be grouped based on the degree to which they represent the learner's understanding of the work environment (indigenous knowledge); cultural filters and learning strategies (learner attributes), and personality traits that affect transfer (self-efficacy). This study analyzes organizational survey text responses for their content, based on coding strategies such as key-words-in-context, and assigns them to one or more themes in the categories of indigenous knowledge, learner attributes and self-efficacy.

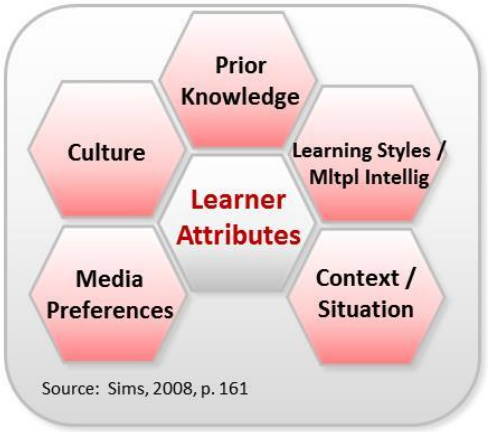
**Indigenous knowledge: Phronesis.** *Phronesis* derives from the Greek description of practical, contextual knowledge that is well known by employees as learners, but difficult for people outside the context to know (Willis et al., 1999). In their discussion of the user-design model, Pastore et al. (2011) describe this as indigenous knowledge (Figure 5), which includes employees' knowledge and even deep understanding of the current workflow; regulations and constraints that affect their jobs, and obstacles – such as red tape, reporting relationships or technology – that slow, stop or

prevent them from getting work done. Best practices and goals and priorities are also indigenous knowledge, as well as how they affect employees' own performance goals, and as a result, their pay. Employees' skills and job-related competencies are also indigenous knowledge; their perception of their skills is an important influence on their perception of their ability to succeed in training (Blume et al., 2010).

Figure 5 Survey response categories: Indigenous Knowledge


**Learner attributes: Cultural filters and learning strategies.** While Sims and Stork (2007) argue that it is presumptuous for designers to attempt to account for the rainbow of personal attributes learners bring to the online learning environment, learners are perfectly suited to report ideas and suggestions for improving their experience based on their particular combination of attributes. As shown in Figure 6, learner attributes include the cultural context that shapes an individual employee's expectations, about training and about the workplace in general; details relating to the context or situation in which they work; prior knowledge that may affect their perception of their ability to succeed, and media preferences and learning styles that may influence their perception of competence in managing the online environment.

Figure 6 Survey response categories: Learner Attributes




Source: Sims, 2008, p. 161

**Self-efficacy: Perception of agency.** This category includes crucial elements of motivation to learn, which, along with cognitive ability, are the most important factors in training transfer (Blume et al., 2010). Self-efficacy is the learner's perception of his or her ability to achieve an objective, such as successfully completing a training program. As shown in Figure 7, this perception is supported by the individual's attitude towards job and career prospects, and the degree to which managers support training – not only verbally, but by allocating a budget, and in availability of back-up resources that enable the employee to take time for training. The employee's self-assessed training needs are important, as well as the extent to which they are aligned with available or assigned training programs.

Work climate can be a deterrent to training; in some workplaces, employees are discouraged from signing up for training as a way of "escaping" daily responsibilities. The concept of "self-in-role" (Kahn, 1990) describes the degree to which employees are fully engaged in their roles at work. Kahn (1990) finds that the quality of "self-in-role," being "psychologically present in particular moments and situations," is not a steady state

for most people; it is intermittent, reflecting the varying degrees of cognitive, emotional and even physical commitment employees bring to their work (p. 693).

Figure 7 Survey response categories: Self-Efficacy


## Chapter 2 Summary

The history of workplace training design reflects an evolution in understanding of how people learn, complicated by revolutionary advances in technology and increasingly disruptive changes in the workplace. Training design, from its origins in military training in wartime, programmed learning and hierarchical task instruction, was refined in step-by-step models of "systematic" prescriptive task sequences. In the current environment of complex technology and learning needs, the design models once praised as efficient and reliable are overturned by the recognition that training design has more in common with design professions that follow a problem-solving orientation, combined with close collaboration involving designers with other stakeholders.

This study adapts training design models that emphasize collaboration, and uses a methodology for involving learners in much greater numbers than has been possible in

the past. Through a methodology of analyzing employees' text responses to organizational surveys, this study enables learners to participate directly in the design and improvement of their workplace training programs.

# CHAPTER 3. METHODOLOGY

## Introduction to Chapter 3

The goals of this study are to develop a deeper understanding of complex phenomena and to test the new idea that employees can participate in workplace training design through their responses to organizational surveys. If survey responses prove to be viable input into training design, this study suggests a practical methodology for incorporating employee input into training design that is accessible to organizations that conduct surveys (Onwuegbuzie, Johnson, & Collins, 2011).

The complex phenomena are text responses submitted by thousands of employees in a variety of industry sectors, prompted by questions that ask them what changes they would make in their organizations to most improve their work experience. While text responses are routinely quantified and summarized as part of survey analysis, no study to date has applied deductive, inductive and abductive methods, to analyze survey text responses as a potential medium for employees to influence the design of their training programs.

In part this is because of the logistical challenges presented by the volume of data. While quantification of key-words by frequency makes it feasible to summarize "what's on their minds" by category or theme, thoughtful inductive analysis of "what they meant when they said that" is time-consuming, and selecting "interesting" response examples, or summarization based on small sample datasets, are insufficiently rigorous to support generalization (Borg & Zuell, 2012).

The philosophical framework that informs the study must account for the validity of respondents' opinions as expressions of their experience, values and intentions, and at the same time, provide versatile and robust methods for analyzing and reporting them (Egbo, 2005). Critical realism holds language as the primary medium of communication in social sciences research, as fundamental as the role of geometry in relation to physics (Bhaskar, 1998, as cited in Egbo, 2005). In its use of inductive and deductive methods for analyzing data such as the text responses in this study, critical realism supports the application of top-down and bottom-up strategies to consider every single text response in the dataset. Through abductive interpretation, critical realism explores whether these accounts of workplace training experiences can be the basis for transformation – in this case, as input into the design and improvement of training programs (Easton, 2010). Critical realism is essential to achieve two goals of this study: testing the new idea that survey text responses may be viable as input into workplace training design, and if so, using a methodology of potential benefit to organizations that conduct surveys.

Because the results of this study have potential value to constituencies outside of educational research, the methodology must be accepted as appropriate and reliable in other contexts, such as business research. The methodology must support "trustworthy research that is meaningful" (Leech & Onwuegbuzie, 2010, p. 78). To be trustworthy, the methodology must conform to the highest standards of academic rigor, following criteria established by leaders in educational research. To be meaningful, the analysis must meet the standards of real-world business contexts in which workplace training occurs.

Table 2 outlines the approach taken in this study to satisfy research standards within the field of education and beyond.

**Table 2 Framework for Methodology Development**

| Domain | Component Description | Application in this Study |
|---|---|---|
| Philosophical Assumptions | Assumptions and justification for the research approach | **Assumptions:**<br>1) Text responses in organizational surveys are complex social phenomena; both inductive and deductive analyses are necessary for deeper understanding (Greene, 2007).<br>2) Employee opinions are reliable observations of workplace phenomena because they correlate closely with external views of the same phenomena (Schneider, Ashworth, Higgs & Carr, 1996).<br>3) Respondents are likely to discuss training in text responses as issues that directly affect their job satisfaction (Borg & Zuell, 2012).<br>**Context-dependent generalizations:** Cultural contexts vary in important ways from one organization to another; cultural differences can be minimized by including several organizations within industry groups / regions / organization types.<br>**Role of values:** Values are reflected in the study's goals: Understanding complex phenomena, testing a new idea, and providing a practical methodology for incorporating employee input into training design (Onwuegbuzie, Johnson & Collins, 2011).<br>**Philosophical justification for methodological approach:** Critical realism, applying deductive and inductive reasoning, followed by abductive inference (Mingers, 2002), to develop conclusions that can be tested through replication (Hubbard & Lindsay, 2012). |
| Inquiry Approach | Research design, Sampling approach, Quality criteria, Researcher's role | **Research design:** Sequential complementary design in which methods are discrete, remain distinct throughout the study (Greene, 2007).<br>**Sampling approach:** Data saturation, selecting all responses for as many organizations as possible in industry sectors most affected by workplace training (Collins, in Tashakkori & Teddlie, 2010)<br>**Quality criteria:** See Table 3, Study Task Plan & Quality Measures<br>**Researcher's role:** Objective third party having no contact with any respondents; critical realist, seeking explanation from available facts (Hubbard & Lindsay, 2012) |
| Research Framework | Study procedures for data analysis, synthesis and results interpretation | **Data analysis:**<br>1) Quantitative phase structures data into thematic subsets for in-depth analysis through **classical content analysis** (key-word codes and frequencies) (Onwuegbuzie & Combs, in Tashakkori & Teddlie, 2010).<br>2) Qualitative phase applies **constant comparison analysis** and **key-word-in-context** analysis to assign text responses to codes and then develop themes from codes (Onwuegbuzie & Combs, in Tashakkori & Teddlie, 2010).<br>**Synthesis / results interpretation:** Abductive inference – qualitative and quantitative components are combined, results compared with emergent design model parameters for evaluation as potential input into training design |
| Cultural Context | Impact of the research on the culture; values-based rationale for the study | To the extent that organizational surveys provide a viable source of input into workplace training design:<br>1) emergent design models capable of addressing ill-structured and wicked problems, by involving learners through survey text responses, can be implemented by organizations of any size, in any industry, through top-down and bottom-up analysis of survey data<br>2) employees as learners acquire "ownership" of workplace training programs they are responsible for transferring to their jobs. |

*Note.* Interpretation based on "Toward a Methodology of Mixed Methods Social Inquiry," by J.C. Greene, 2006, *Research in the Schools, 13* (1), 93-98.

The most significant challenge in the study is presented by the nature of the data, the complex text responses of thousands of individuals on the subject of training in their

workplaces. These individuals work in industries as varied as manufacturing, energy, retail, healthcare and telecommunications. For some, training involves demonstrations of equipment or products with hands-on practice; for others, training may occur online, in the form of licensing or certification programs that prepare them to use new software releases or to interact with customers. To meet the standard of "trustworthy research that is meaningful" (Leech & Onwuegbuzie, 2010, p. 78), a methodology must be sensitive to the unique characteristics of the industries represented in the datasets, and the possibility that text responses include multiple topics. The methodology must also enable a targeted sampling strategy within a dataset of thousands of text responses, for close analysis of "what they mean when they say that."

The standard is achieved in this study through the design of the sampling strategy, and through the application of mixed methods in the data analysis. The sampling strategy applies deductive analysis to all datasets to develop major themes, with results validated through thematic analysis of subsets of data. The sampling strategy also provides an approach in the deductive phase, for selecting "information-rich" data (Patton, 2002) for the second phase of the study, inductive analysis.

The data analysis strategy applies quantitative and qualitative methods within the philosophical framework of critical realism, a framework accepted in business research as well as in educational research (Mingers, 2004; Nash, 2005). Critical realism supports the top-down approach necessary for analyzing an extremely large dataset, while at the same time applying a method of in-depth analysis that respects the unique context in which each respondent wrote a survey comment (Easton, 2010).

The task plan for this study is presented in Table 3, which also displays quality measures followed in the study to provide a basis for evaluating the methodology.

**Table 3 Task Plan and Quality Measures**

| Task | Quality Component | Component Description | Application to Task | Quality Measure |
|---|---|---|---|---|
| Planning | Design Suitability | Design appropriately addresses overall research question | Complementarity – strengths of quantitative (themes / frequencies) and qualitative ("case study" analysis of individual responses). Quantitative phase creates datasets for qualitative analysis | Analytical model should hold true across multiple samples (Hubbard & Lindsay, 2012) |
| Strategy | Design Strength | Appropriate application of methods to minimize bias / optimize potential breadth & depth of analysis | Software (NVivo) assigns codes in the qualitative phase, a "clear analytic advantage" of consistency and speed in managing very large datasets, and "facilitates a richer and potentially more valid analysis" (Bazeley in Tashakkori & Teddlie, 2010, pp. 438 & 444) | Consistent key-word selection based on data-driven lexicon of key-words and synonyms removes researcher bias in creating datasets for inductive analysis |
| Data Collection | Sampling Adequacy | Sampling technique and sample size are appropriate to the design | Datasets comprise as many responses as possible in subsets by industry sector, taking into account a variety of industry sectors that may view workplace training as a strategic advantage | Consistent cultural context reduces errors related to translation, vernacular, shared world-view, survey design / intent (Liu, Borg & Spector, 2004) |
| Data Analysis | Analytic Adequacy | Data analysis techniques are appropriate for the research question | Top-down deductive analysis followed by bottom-up inductive analysis applies confirmatory and exploratory methods in a search for relationships between employee text responses and benchmarks (Tashakkori & Teddlie, 2010) | Transparent method enables replication (Hubbard & Lindsay, 2012) |
| Synthesis | Analytic Integration Rigor | Integration that occurs during analysis is robust; data transformations are defensible | Manage context-dependent generalizations to preserve unique contexts (e.g., online training is a severe problem in one organization but works very well in another), explicitly account for these differences during synthesis phase | Abductive analysis tracks differences as well as commonalities in survey responses |
| Synthesis | Interpretive Transparency | Clarity in mapping methods to findings | Quantitative coding maps into qualitative themes, results of qualitative analysis of "information-rich" responses (Patton, 2002) compared with learner attribute / indigenous knowledge benchmarks specified by the emergent training design model specified for this study | Mapping codes to themes to benchmarks is replicable by others in different contexts |
| Synthesis | Interpretive Transferability | Conclusions can reasonably be applied to other contexts / settings | Abductive reasoning – Explanation of results derives from evidence in the data: "plausible (best) explanations for the facts researchers possess" (Hubbard & Lindsay, 2012). | Results that are repeatable over a wide range of conditions (Hubbard & Lindsay, 2012) |

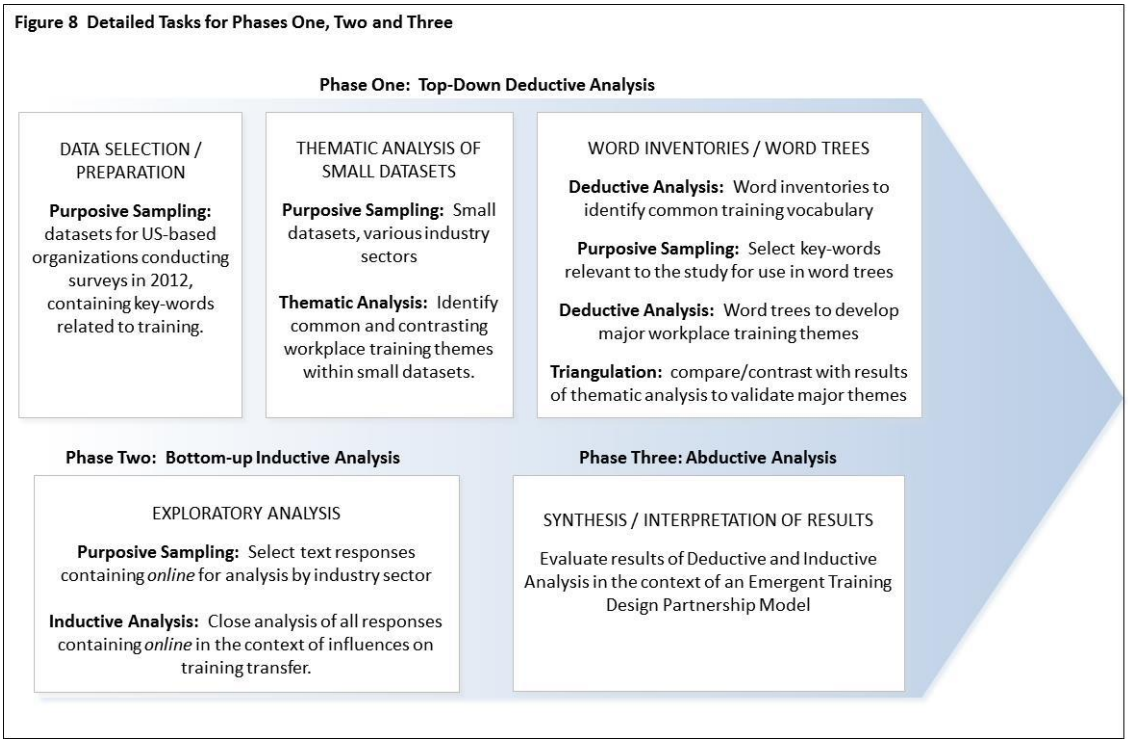
*Note.* Interpretation based on "Validity issues in mixed methods research: Calling for an integrative framework," by A. Tashakkori & C. Teddlie, Paper presented at the annual meeting of the American Educational Research Association, San Francisco, April, 2006.

Critical realist research applies three research methods for data analysis: deduction, induction and abduction. In this study, the deductive phase provides a top-

down view of all text responses, as described above. Through iterative analysis and comparison with thematic analysis of selected datasets, the deductive phase develops major themes that are meaningful for the study.

Figure 8 shows the structure and sequence of tasks in the deductive, inductive and abductive phases of the project. As shown, sampling and analysis tasks are applied in the deductive and inductive phases, to prepare data for subsequent analysis while at the same time responding to the study's research questions.

**Figure 8 Detailed Tasks for Phases One, Two and Three**




The size of the dataset presents a particular challenge in the deductive phase of the study, when the methodology must provide a reasonable means of analyzing thousands of records, with the sensitivity to preserve the meaning and intent of individual comments. This is a familiar challenge in analyzing survey text responses (Borg & Zuell, 2012), addressed in this study using the mixed methods approach of triangulation (Greene, 2007). As shown in Figure 8, quantitative analysis (word inventories and word

trees) is applied to all text responses, and qualitative analysis (thematic analysis) is applied to a subset of responses, independently and concurrently. Results of qualitative analysis are compared and contrasted with results of quantitative analysis, to identify common themes and anomalies requiring further analysis.

The deductive phase of the study follows a sequence of sampling and analysis, with each task used to shape the next:

1. **Purposive sampling** is applied to select datasets for thematic analysis, which provides a baseline of themes about workplace training. Datasets are chosen based on their size (smaller datasets make close analysis of all responses feasible) and the industry sectors they represent. Results of this analysis will be compared and contrasted with results of analyzing all datasets; therefore, this sampling task should select responses that are as varied as possible, to provide a broad baseline of themes.
2. **Thematic analysis** requires close reading of responses in selected datasets, focusing on identifying themes within the context of the comments in which they occur. Themes are coded based on content and relevance to the study, using key-words and phrases found in the responses.
3. **Word inventories** are created for all 18 industry sectors. Word inventories report all words used in all text responses, with frequencies. The objective of this analysis is to identify words relevant to workplace training for creation of word trees; results are reported in lists of relevant key-words by frequency across all industry sectors.

4. **Purposive sampling** is applied to select relevant key-words from the results of word inventories for creation of word trees. Relevance is determined through comparison with the results of thematic analysis, and key-word frequency through all industry sectors.
5. **Word trees** display key-words in the context of preceding and following phrases, providing a context that allows deeper understanding of how key-words are used. By iterative creation of word trees, for key-words and other words of interest found in the preceding and following phrases, it is possible to develop major themes related to workplace training.
6. **Triangulation** requires comparison and contrast of major themes developed through word trees with the themes identified in thematic analysis, to identify anomalies between these two sources of themes. Anomalies are then explored through additional word trees, to better understand the nuances and revise the language of the themes. Comparison and contrast, working back and forth between results of thematic analysis and words, is repeated until anomalies are resolved or fully explained (Creswell, 2009).

The inductive phase likewise contains both purposive sampling and analysis, to explore "information-rich" (Patton, 2002) text responses for evidence of experiences and suggestions related to workplace training:

1. **Purposive sampling** is applied to select one or more key-words as suitable for in-depth analysis as potentially viable input into workplace training design.

2. **Inductive analysis** involves close analysis of all text responses containing the selected key-word or key-words, with responses being coded according to factors influencing training transfer, as explained in Chapter 2.

The abductive phase seeks to interpret the results of analysis in the deductive and inductive phases, in part by comparing results with the emergent training design partnership model suggested in this study.

Critical realism supports the possibility of emergence as an attribute of the data (Easton, 2010). From the thousands of individual responses within the dataset there is the potential for a separate reality about workplace training to emerge, one that none of the respondents could individually intend. An important aspect of the abduction phase of interpreting results will be the degree to which the data suggest an emergent "voice" in workplace training design.

## Purpose of the Study

The purpose of this study is to explore the viability of text responses contained in organizational survey data as input into the design of workplace training, especially in the online learning environment, where inherent ill-structured problems call for collaboration by as many stakeholders as possible in working toward solutions. To the extent that employees use survey responses to record their views about training programs at work, their responses could represent a useful source of input in solving ill-structured problems, and in making decisions that affect the design and improvement of workplace training.

## Research Questions and Hypotheses

Research questions for this study seek to understand the breadth of topics raised in text responses, as well as the depth of detail in responses on relevant topics.

**Central research question**

To what extent do text responses contained in organizational survey data represent viable employee/learner input into workplace training design?

**Central quantitative research question**

What are the most frequent themes relating to workplace training programs that appear in organizational survey text responses?

**Qualitative research questions**

How do employees describe their current experience of online training in their workplace?

What would employees change to improve online training programs in their workplace?

What do employees describe as strengths / weaknesses of online training programs in their workplace?

**Synthesis research question**

To what extent does employee feedback about workplace training meet the criteria of input into workplace training design?

## Research Design

This is a **sequential complementary mixed methods design**, applying methods of analysis within the philosophical framework of critical realism. In a sequential design, each phase of analysis yields results that inform the subsequent analysis phase, and each phase builds upon the results of prior phases. For example, in this study, the first phase of top-down analysis identifies subsets of potentially "information-rich" data suitable for

inductive analysis (Patton, 2002), as well as reporting overall themes and frequencies, in response to the quantitative research question. The inductive phase explores subsets of data identified in the deductive phase, analyzing responses in the context of influences on training transfer, as well as additional contexts suggested by the content of the responses.

The deductive (quantitative) and inductive (qualitative) phases are discrete, and results from each phase are distinct, characteristics of sequential design. The rationale for applying a mixed methods approach is complementarity, in which the study benefits from the strengths of each method (Onwuegbuzie & Combs, 2011). Within the deductive phase, the mixed methods approach of triangulation is also applied (Greene, 2007), comparing results of close analysis of data subsets with major themes developed across all responses, to support and validate "what's on their minds" with detailed insights of "what they meant when they said that."

The synthesis phase applies abduction, or interpretation for the purpose of explanation (Easton, 2010), to build understanding of the complex phenomena of text responses to organizational surveys (Greene, 2007). A consideration during this phase is whether the responses, taken together, represent an emergent phenomenon – the "voice" of employees as learners in workplace training design.

## Target Population, Sampling Method, and Related Procedures

### Target population

The population comprises all text responses to organizational surveys that were administered by the survey provider in the year 2012, in the United States. In any given year, hundreds of organizations around the world conduct surveys that are administered by the survey provider's psychologists and social scientists. In 2012, more than 250

organizations with employees located in the United States were surveyed, representing more than 20 industry sectors and 1.25 million employees.

Within this population, 59 organizations headquartered in the United States administered surveys in 2012 to their US-based employees. The cultural context of the survey – "US-based employees" – is an essential consideration in the critical realist framework, which seeks to understand not only the observable phenomena but also the underlying structures and mechanisms that influence them (Clegg, 2005). Ensuring that all respondents share a common cultural context, for example, in which "9/11" refers to a specific tragedy affecting our financial capital, national symbols, and thousands of people; and "the Great Recession" refers to a period of worldwide financial collapse, largely caused by American institutions that were subsequently rescued by our elected officials – may affect the assumptions and even the language respondents use to describe their work experience. Therefore this study limits data selection to the sub-population of 59 organizations with headquarters and surveys administered in the United States in 2012.

Data for this study resides in a commercial database owned and maintained by the survey provider. It was first necessary to obtain permission from the provider to access the data, within stringent parameters of data security, data and client confidentiality, and protection of intellectual property. Since the data for the study already exists, data preparation takes the place of usual research activities related to recruitment, contact and screening of participants.

The database of survey responses is maintained on electronic network storage, by survey project, by client and by data type. Survey data takes two forms: numeric

responses to scaled opinion items, and text responses to open-ended prompts. Numeric survey responses are not analyzed in this study, because most surveys limit the number of opinion items regarding training to one or two – or none at all – and the presence of an item about training is not an indicator for the presence of text responses about training. Text responses are stored in spreadsheets with two fields per response: a self-selected category code, such as career advancement, pay and benefits, or training, and comment text.

**Sampling methods**

The primary goals of the study were to build deeper understanding of the complex phenomena that text survey responses represent (Greene, 2007), and to investigate the viability of text responses as input into workplace training design. To meet these goals, a sequential mixed methods sampling strategy was used, to create and then structure text responses for both deductive and inductive analysis (Teddlie & Yu, 2007). As discussed earlier in this chapter, sampling tasks are integral to both the deductive and inductive phases of the study.

**Sampling methods for deductive analysis**. The size of the datasets posed significant challenges for design of the sampling strategy. Within the critical realist framework that values all participant communications, it was important to evaluate text responses in the context of their industries, including manufacturing, energy, retail, professional services, healthcare and telecommunications, each of which may have unique needs for, and uses of workplace training. As shown in Figure 8, 59 datasets accepted into the study were classified during data preparation by industry, and statistics documented survey participation rates, overall and for respondents who wrote text

responses, as well as for the number of responses containing key-words related to training. Component datasets in each industry sector were combined into industry datasets, which were used to build word inventories and word trees.

Purposive sampling was applied as the first task in deductive analysis, to select datasets for thematic analysis, necessary to support triangulation, through which major themes developed in the deductive phase were validated by comparison and contrast with themes developed through close analysis. Five small datasets were selected for thematic analysis, in part because their small size made one-by-one response analysis feasible, and in part because they represented a variety of industries with varying characteristics and training needs.

**Sampling to create the dataset for inductive analysis.** Purposive sampling was conducted at the beginning of the inductive phase, to select datasets based on the presence of relevant key-words for close analysis. Because of the relevance of text responses about online training for the study, word inventories for all industry sectors were analyzed for the presence of the key-word *online*, with the goal of identifying industries in which online training was an important response topic. All industry sectors were found to have at least a few responses containing the key-word *online*, and several industries were found to have significant frequencies of the key-word. During deductive analysis, word trees were produced for industry sectors containing more than 100 comments with the key-word, and the results were reviewed for content and value as responses about online workplace training. While word trees do not reflect the full context of the responses in which they appear, it was evident from this review that text

responses containing the key-word *online* contained details about online training, confirming the feasibility of conducting inductive analysis using this subset of data.

**Data preparation**

Survey data is stored by client and project, rather than by topic, and therefore it was not possible to select "all 2012 text responses about training." Given the size of the population, purposive sampling played a crucial role in defining datasets.

As described above, datasets were accepted into the overall sample for the study based on the following criteria: surveys conducted by a single provider for organizations headquartered in the United States, in 2012, a total of 59 organizations. Recognizing the importance of language as an element of cultural context, only English-language survey responses were accepted into the study.

Surveys were of the census type, meaning that all employees in the organization received paper or online surveys and all were encouraged to respond. Datasets contained at least hundreds of key-words related to workplace training, learner attributes, indigenous knowledge or learning strategies. Survey clients previously agreed to allow their data to be included in studies conducted by the survey provider, other than their own projects, and only text responses were incorporated into the dataset for this study.

Selected datasets were subjected to scrubbing prescribed by the survey provider. Text responses were thoroughly cleaned for any identifying information, such as personal names, personal details, company names, product names, using masks, such as [NAME], [COMPANY] or [PRODUCT]. Text responses containing recognizable identifying details were deleted from the dataset. With completion of data scrubbing, the dataset was prepared for the deductive phase of the study.

## Setting

Surveys are administered as part of normal business operations. Employees receive invitations to participate, usually from organization leadership, and usually delivered by email. Employees with access to computers usually complete their survey submissions online, with online submissions routed to the third-party survey provider for processing and analysis. Employees without access to computers complete a "paper-and-pencil" survey booklet, which is mailed to the third-party survey provider, where it is transcribed into electronic form for processing and analysis.

Invitations to employees often position organizational surveys as interventions; that is, as data-gathering in preparation for making organizational changes to improve the work environment. Employees are encouraged to participate as agents of change, making suggestions based on their own experience, to improve their work environment.

## Instrumentation

The provider's survey instruments are comprised of 50 to 75 opinion items and one or more open-ended text response prompts. Individual surveys are tailored based on client specifications, including more or fewer items depending on goals and objectives of conducting the survey. Within surveys, individual items may vary slightly, for example, by including the company name or the title of a company officer.

Most clients choose from the provider's library of opinion items, which have been developed, tested and refined over 40 years of survey administration. Items take the form of a statement with a scale of potential responses. The most frequently used opinion item related to training is: "*The training I have received has adequately prepared me for the work I do*." *Agree / Tend to Agree / ? / Tend to Disagree / Disagree*

Most clients select items from the provider's library because they can be readily compared to scores from other organizations in the same industry or geographic area, or along demographic lines, such as management, high-performing companies, etc. Item scores are processed by the survey provider's automated system.

Text responses may be prompted by a variety of open-ended questions, such as: "What one or two changes would most improve your work experience?" "What would you do to improve our company's competitive position over the coming year?" "What do you like best about working for this company?" "What do you like least about working for this company?" While respondents are free to respond in any way they choose, prompts that invite them to suggest changes that would improve their work experience raise the likelihood that they will address aspects of their work environment that directly affect their job experience.

Text responses are measured not on evidence of validity, but of relevance to the study, which is determined through iterative analysis for the presence of key-words and themes, and through triangulation, to validate themes against detailed analysis of a subset of data, in the deductive (quantitative) phase of the study.

No sample survey is included with this study, for two reasons. First, surveys are client-specific, and contain data that is confidential to the clients. In this study, all identifying features are removed from text data, and companies are designated based on their industry and a numeric counter (e.g., the first financial services company in the study has the indicator FS-1). Second, survey designs and items are proprietary to the provider, and cannot be disclosed.

## Data Collection

Data collection must be systematic in order to be replicable, providing a basis for future research (Poncheri, Lindberg, Thompson, & Surface, 2008). The dataset for this study is maintained by a commercial human resources consulting firm which authorized access to, and analysis of the data. The firm is a global leader in this field, and surveys are administered by credentialed social scientists. Surveys are designed, administered and analyzed through a survey methodology that has been tested and refined over forty years of continuous survey administration.

Respondents are employees of client organizations. They receive an invitation and several messages from senior leadership in advance of the survey, advising them of the value and importance their organization places on the survey; that their opinions and comments will remain confidential, and that responses are summarized at specified group sizes, to prevent individuals from being recognizable by their responses or demographic data. Survey data used in this study contains no identifying details which could link data to individual respondents or to their organizations. However, comments may contain names, locations, or other identifying data supplied by respondents; these values were masked (e.g., [NAME]) during data preparation.

Data for the study was selected from hundreds of surveys conducted each year for clients around the world. While many surveys draw their format and content from a normative inventory of opinion items and comment prompts, each survey is tailored to individual client circumstances. Therefore, considerable discernment was applied to select "like" surveys for this study.

For example, more than one type of survey may be conducted for a client. There may be a full census survey of all employees conducted every two to three years, with interim "pulse" surveys conducted in the intervening years. "Pulse" surveys may not include text responses, making them ineligible for this study. "Joiner/leaver" surveys of newly-hired or departing employees may have a different survey format and are conducted in unique circumstances, making them ineligible for the study.

The criteria for inclusion in this study are: census surveys conducted in the United States in the calendar year 2012, with text responses containing at least several hundred references to *training* / *online* / *e-learning* or related terms. Text responses were scrubbed for names, locations, and other identifying data, and were saved by industry sector and dataset number.

## Data Analysis Procedures

As discussed earlier in this chapter, the size of the datasets posed a fundamental challenge in the study. To provide rigorous analysis of large text datasets is an ongoing challenge to researchers (Bazeley, 2009; Borg & Zuell, 2012), which partially explains the gap in the literature for in-depth analysis of text responses about training. Figure 8 shows how quantitative and qualitative methods were applied to support development of themes across all responses, while preserving nuances that affect the meaning and intentions of individual responses. Key analysis tasks are explained in more detail below.

### Triangulation to validate quantitative analysis

Since respondents were likely to have widely varying points of view, by industry and within their own companies, it was important to establish a baseline of common themes representing the various ways respondents described training. This was done

through triangulation (Greene, 2007), in which quantitative and qualitative methods were applied independently and concurrently in the deductive analysis phase, to minimize the bias inherent in either method. Thematic analysis was applied to selected datasets to develop a baseline understanding of themes around workplace training within specific contexts, and quantitative analysis was applied to all datasets, to quantify vocabulary terms and major workplace training themes across industry sectors. Results of these analyses were compared and contrasted to develop and validate major themes about workplace training.

**Thematic analysis of small datasets**

Five small datasets were selected for thematic ("close") analysis in the deductive phase, to provide a baseline for comparison and contrast with major themes developed through deductive analysis of all datasets. This was done to offset the inherent bias in deductive methods that quantify key-words and phrases but may miss contextual meaning in language not captured by quantification.

While word inventories and word trees make it possible to include many text responses in deductive analysis, there is a risk of misinterpreting the context of the words and phrases presented in word inventories, and even in word trees, which display phrases of up to ten words surrounding the key-word. Text responses in this study averaged 117 words, suggesting that respondents wrote in some detail about their training experiences, or indeed, about other topics. It is reasonable to be cautious in assessing the meaning of a ten-word phrase outside the context of a much longer text response.

The five small datasets represented energy / utilities, professional services, oil & gas, leasing services and natural resources. Three of these industry sectors might involve

physical labor, such as mining and use of heavy equipment, while professional services and leasing services might involve project management and client or customer service. These sectors were chosen for thematic analysis because their small datasets made close analysis of all text responses feasible; however, caution was important throughout the analysis, given that these responses might vary considerably from those derived from industries such as healthcare and retail. The small dataset text responses were studied carefully for evidence of industry- or organization-unique characteristics that might limit their value in validating major themes developed through deductive analysis of the large datasets.

Thematic analysis involved closely reading text responses in each of the five datasets, to identify and quantify themes related to workplace training (Creswell, 2009, p. 174, "codes . . . developed to form a description or to identify themes"). There were 21 themes identified in total. Although there was considerable overlap across the datasets, no attempt was made to consolidate the language of themes, in order to provide a broader baseline for subsequent analysis (Creswell, 2009, p. 175, "themes from the bottom up").

**Word inventories**

All 18 datasets were subjected to word inventory analysis, using the text mining application NVivo. Lists were created for each dataset showing all words used in all responses, along with the frequency of each word's appearances. Many of the most frequently-used words do not relate directly to training; for example, because of the use of masks such as [COMPANY], the word *company* was the most frequently-used word in most of the datasets.

The first task in deductive analysis was to build a list of words related to training, in order of frequency, for each industry sector. Most frequently-used key-words were compared and contrasted across industry sectors, and with the themes developed for small industry sectors, to build understanding of the context in which key-words related to training were used. Key-words with greatest relevance for the study were chosen for analysis using word trees.

**Word trees**

The NVivo application was used to create word trees, visual representations of phrases that include one of the selected key-words. Word trees display the five words preceding and the five words following the key-word, for all occurrences of the key-word in the dataset, using brackets to group common phrases. Word trees provide two kinds of information about the key-words: the variety of phrases preceding and following the key-word, and a visual representation of the frequency of particular phrases.

Word trees for all industry sector datasets were compared and contrasted to identify unique vocabulary and phrasing characteristics by industry, as well as common phrasing around key-words. In addition to the key-word *training*, word trees were created for the most frequently-used words identified in word inventories, including *need*, *time*, *learn*, *opportunity*, and *better*. Because of its importance to this study, word trees were also created for the key-word *online*, although none of the word inventories counted this key-word among its most frequently used.

Phrasing in word trees was used to develop a draft of major themes across all datasets. These were compared and contrasted with themes developed through thematic

analysis of small datasets, to develop a profile of themes by industry sector, and across all sectors.

**Results of the deductive phase**

Early evidence in thematic analysis of small industry sectors suggested that respondents used a common vocabulary to describe their experience of workplace training. Similarities in word inventories confirmed this finding, which was further validated by word trees by industry sector, which displayed common vocabularies in phrases surrounding key-words. It was possible in reviewing word trees to identify the same major issues again and again, with little variation across industry sectors. The phrasing in word trees also suggested that *training* is regarded as a general category of experience, as though "everyone knows what that is."

Six major themes were developed through analysis, comparison and contrasting of key-word phrases identified in word trees. These themes were then compared with the 21 themes identified in close analysis of the small datasets. Close alignment between major themes across all datasets, and themes developed through bottom-up analysis of small datasets, provided validation of the top-down methodology in analyzing very large datasets.

Outputs from the deductive phase include word inventory listings of key-words and frequencies, themes and frequencies developed in close analysis of small datasets, and word tree displays for key-words relevant to the study. Analysis of these outputs was used to develop six major themes across all datasets, in response to the quantitative research question: *What are the most frequent themes relating to workplace training programs that appear in organizational survey text responses?*

As described in the sampling strategy for the deductive phase, word trees created for the key-word *online* suggested that text responses about online workplace training were likely to be "information-rich" (Patton, 2002), and therefore suitable for inductive analysis. Datasets across all industry sectors contained the key-word *online*; purposive sampling was used to create subsets of data containing the key-word *online* by industry sector, for inductive analysis.

**Inductive analysis of text responses about online workplace training**

As described above, all responses using the key-word *online* were segregated by industry sector for inductive analysis. Datasets were created through an NVivo text query, and a separate NVivo project site was created for each industry sector, containing the dataset of text responses and the analysis framework for this phase.

**Analysis framework: *What will they say?***

As discussed in Chapter 2, this study assumed that text responses would reflect the experience of employees as learners, who are responsible for transferring what they learn in training to the day-to-day activities of their jobs. Major influences on training transfer were expected to provide a reasonable framework for organizing text responses, within the categories of indigenous knowledge, learner attributes and self-efficacy.

**Analysis protocol for inductive phase**

Inductive analysis required close reading of all text responses, with all or portions of each response coded according to the factors influencing training transfer that best correspond to the experience and suggestions in the response. Figure 9 shows how categories and elements appeared in NVivo projects set up for each industry sector. As shown in Figure 9, NVivo displayed the frequency of references to each element within

categories. Because individual responses contained one or more topics, a single response was often represented by more than one code. Frequency counts reflect the number of mentions, rather than the number of responses, and only references to online training were included in frequency counts.

**Figure 9 Influences on Training Transfer Reflected in Categories and Elements in NVivo**

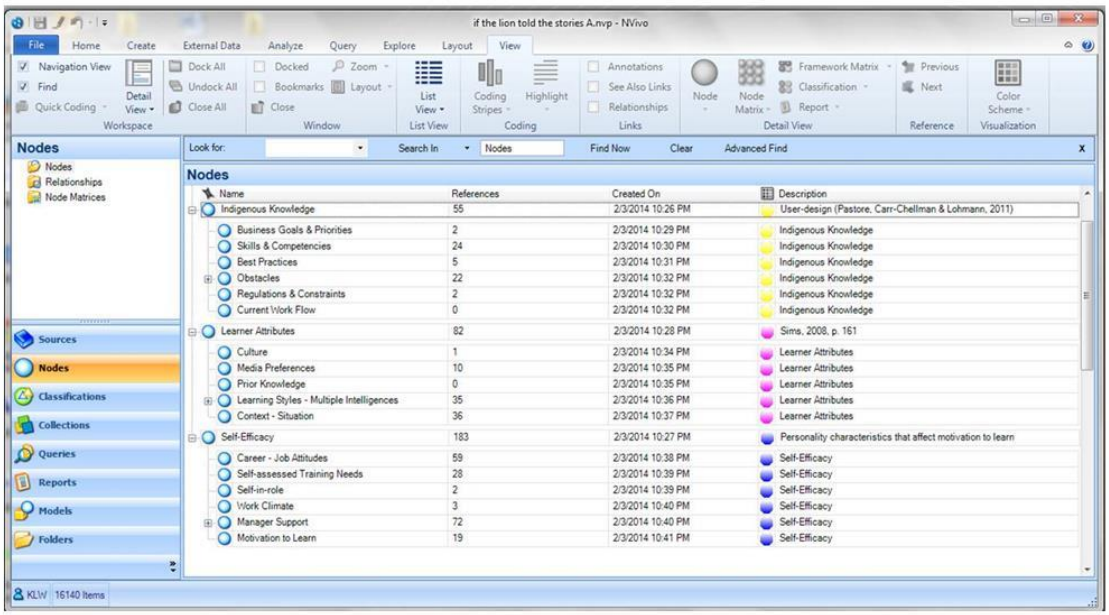



Figure 9 Screen shot of categories and elements used to organize text responses containing the key-word online. Datasets were saved and coded in the application NVivo, with frequencies summarized by category and element.

Figure 9 presents summarized frequencies for the Financial Services industry sector. There were 320 coded references to online training in this sector, out of a total of 689 references to the key-word *online*, which was frequently used in phrases such as *online banking* and *online accounts*.

**Results of inductive analysis in four contexts**

Responses were summarized by categories related to influences on training transfer, and individual categories were illustrated with a series of statements developed

from comment text, representing the breadth and depth of topics. Some responses were selected as quoted examples of respondents' views.

In addition to the coding criteria associated with influences on training transfer, respondents' descriptions of online training suggested other contexts in which responses could be understood. References to available budget and resources to support training suggested viewing responses in terms of the overall business environment, especially in industry sectors for which training is central to strategy. Details about how respondents experience online training suggested that some responses should be considered in terms of learning theories and designs. Some respondents suggested "out-of-the-box" uses of online technology to improve the quality of training, suggesting a context of creative use of the online environment.

**Abductive analysis in the context of an emergent training design partnership**

Respondents described their experience of training within the broader context of their organizations' priorities and competitive strategy. Responses also suggested a sense of "ownership" of online training programs, as if respondents take responsibility for their online training experience. This phase analyzed the results of deductive and inductive analysis in the context of the emergent training design partnership suggested in this study.

## Limitations of the Research Design

This study is limited by the number of surveys available for analysis. While a considerable number of employee responses were analyzed, they do not represent the universe of employees, organizations or industries. This study makes no attempt to generalize results for industries and organizations not included in the analysis. The study

demonstrates a methodology for analyzing survey text responses, whenever and wherever they occur.

## Credibility

Credibility is established and maintained throughout this study through four strategies: reliability and consistent handling of data; "samples within samples" (Teddlie & Yu, 2007, p. 90) purposive sampling strategy; methodology documentation, and expertise of the researcher.

### Reliability and consistent handling of data

The data for this study were prepared and processed by an experienced survey provider, to the highest standards of accuracy, completeness and consistency, following automated processes developed over forty years of survey administration. The mixed methods design in this study is data-driven, to avoid the bias inherent in external lexicons, and makes full use of automated analysis techniques to minimize researcher bias. Text responses were not manipulated or changed in any phase of the study. Qualitative (inductive) analysis and synthesis phases compared text responses with criteria for learner input into workplace training design, never altering the responses.

### Purposive sampling strategy

The "samples within samples" (Teddlie & Yu, 2007, p. 90) purposive sampling strategy describes how data were selected, and subsets of "information-rich" data (Patton, 2002) were identified for qualitative analysis. The first purposive sampling task was used to select the overall study sample, as the first step in data preparation. Text responses were selected based on the presence of key-words related to workplace training, using a consistent process applied to all text responses for all 2012 survey projects, conducted for

organizations headquartered in the United States. Two purposive sampling tasks were applied in quantitative (deductive) analysis. The first involved selection of five datasets for thematic analysis, and the second used the software application NVivo to derive key-words and themes contained in text responses through creation of word inventories and word trees. Purposive sampling was applied at the beginning of the inductive phase, to select datasets containing online, the key-word identified as most relevant to respond to qualitative research questions.

**Methodology documentation**

While mixed methods research continues to grow in importance in the social sciences, scholars identify many outstanding issues in regard to how methods are applied. Text survey responses are not often subjected to rigorous academic study, in part because they are perceived to be unreliable, mostly negative and subjective (Borg & Zuell, 2012). By practicing and documenting a reliable, replicable methodology for deriving insights regarding training in the workplace, this study may encourage perceptions that text responses to organizational surveys represent a valuable resource which can be reliably and efficiently investigated. Moreover, the critical realist philosophical framework holds language – and the human agency of respondents – as the essential medium of social science research. Within this framework, care is required in analyzing and documenting communications that clearly reflect a business context distinct from this study.

## Dependability

A significant component of the researcher's experience in systems design is in documenting procedures and conducting user training programs. From these experiences the researcher learned the life-long lesson that procedures must be understood from the

perspective of the person who carries them out, rather than the person who developed the systems. Successful documentation of procedures and methods builds confidence that the learner can find answers to questions that begin, "How do I . . ."

A secondary goal of the study was to provide straightforward and easy to replicate procedures and methods for analyzing large text files, in part to encourage organizations to "give employees a voice".

## Transferability

This study called for as large a population of survey respondents as possible, in order to provide a reasonable basis for investigating the degree to which survey responses provide a viable source of employee input into workplace training design. The database identified for this study is one of the largest in the world, created and maintained by one of the best-known and most respected survey providers. Survey responses were selected for this study based on evidence in the data that workplace training experiences were a subject of responses. By applying a reliable, replicable mixed methods approach, this study provides an approach for organizations to apply input from survey responses to design and improve their own workplace training programs.

## Expected Findings

The average response rate for open-ended comments ranges between 40-60% of survey responses, accounting for one-third to one-half of most organizations' overall employee population. The intent of the study is, therefore, not to attempt to account for (or generalize to) the totality of opinions in the population, but rather to identify specific views expressed in text responses, describing what works, what does not work, and what could be improved in workplace training programs.

Anecdotal evidence suggests that, at a minimum, the study should discover the following findings: About 12-15% of comments for each organization in the dataset are likely to address training. Respondents are not likely to address specific functions and features of training applications, or discuss characteristics of particular instructors. The general nature of the prompt for text responses – "What one or two changes would most improve your work experience?" – may have encouraged respondents to think of how training is conducted in their organization, rather than reacting to a specific training event. Isolating and analyzing these comments is the intent of the study.

With respect to the research questions posed in this study:

*To what extent do text responses contained in organizational survey data represent viable employee/learner input into workplace training design?* Text responses should provide detailed and useful insights that are viable as input into training design. Responses are likely to be especially strong in identifying what does not work in current workplace training programs, consistent with survey prompts that call for suggested improvements, and with research suggesting that employees are excellent observers of workplace conditions (Wiley, 2010), and that their descriptions are validated by external observations of the same conditions (Schneider, Ashworth, Higgs, & Carr, 1996).

*What are the most frequent themes relating to online workplace training programs that appear in text responses contained in organizational survey data?* Based on the researcher's experience in analyzing text responses, the most frequent theme is likely to be that employees are not able to attend training because of workload, lack of management support, short-staffing, and inadequate training budget. Another frequent theme is likely to be that training is not linked to career opportunities or salary increases.

While these themes are important, they are not necessarily resources for input into workplace training design. It is hoped that themes related to training experiences in the online environment will also have high frequencies.

*To what extent do text responses contain viable input for online training design?* Employee input is likely to fall within the major categories of workplace constraints, cultural filters and learning strategies. It is reasonable to expect that employees will use text responses to describe topics directly affecting their job satisfaction (Borg & Zuell, 2012), which might well include the impact on their training experiences of workplace constraints, cultural filters and learning strategies.

*How do employees describe their current experience of online training in their workplace?* Respondents are likely to discuss online training because they have strong views about the way that training is conducted in their workplace. Respondents will likely acknowledge that online training is growing as a percentage of training in their organization, because it is perceived to be less expensive and more "portable" than face-to-face training.

*What would employees change to improve online training programs in their workplace?* Some respondents are likely to have constructive suggestions for improving training in their workplace. For example, respondents may call for training to be an important component of performance reviews, including mapping a training program as part of career planning, and progress reports incorporated into salary planning. Some may point out that training should be a cultural value or strategic goal for the company. Some may call for supervisors to support them in signing up for, and actually attending / completing training. In the current era of scarce resources, employees may find it

difficult to make time apart from their daily work to attend training. A supervisor's support may be essential in making sure training happens.

*What do employees describe as strengths / weaknesses of online training programs in their workplace?* Respondents are likely to express frustration at "online training" that is delivered via email, or as posted content on a shared intranet site, or as a "desk drop" delivered on the day they need the information to do their jobs. Respondents may say that they are not given enough time for their assigned online training, and that often they are expected to complete online training after work hours. Insufficient time often corresponds to failing the quiz and having to retake the training.

## Ethical Issues

### Researcher's Position Statement

The researcher's pre-understandings fall into four categories: worldview with respect to this study; worldview with respect to the survey process; reliability of systems and applications, and expectations with respect to the data.

The researcher's worldview with respect to this study is critical realistic; that is, the researcher assumes that the data analyzed in this study is real, the product of social behavior by human beings in responding to surveys in their workplaces. The data represents complex phenomena that are external to the views of the researcher and the processes of the study.

The researcher's worldview with respect to the survey process is pragmatic. The researcher is convinced of the impartiality, accuracy, completeness and reliability of the data to be used in this study because of the pragmatic social scientific approach taken by the survey provider. The provider's survey administration and data processing were

developed and refined over four decades of practice, with an orientation toward "what works" (Creswell & Plano Clark, 2007). The data used in this study has been accepted by survey administrators and clients, and is therefore in its most reliable and accurate state.

The researcher's critical realistic worldview also shaped the study, which is designed to take into account the limitations of quantitative analysis of text responses, which can identify common key-words or phrases but fall well short of in-depth analysis of what respondents "really said" (Bishop & Kulesa, in Kraut, 2006). The critical realistic worldview, with its emphasis on the validity of personal communications as authentic expressions of social actors, and its practicality in applying the methods best suited to the research problem (Clegg, 2005), governed the choice of mixed methods for this study.

The researcher's worldview with respect to systems and applications is also critical realist, in its insistence on maintaining data integrity by minimizing bias. This study requires extensive manipulation of very large text files, to elicit key-words and themes as the basis for selecting "samples within samples" (Teddlie & Yu, 2007, p. 90). In this study, the software application NVivo was used in iterative cycles to identify key-words and themes at successively greater levels of detail. Aside from greatly reducing the time required for this analysis, NVivo overcame the human failings of missing key-words, miscounting, inconsistent coding and otherwise imperfectly carrying out the task.

The researcher's worldview with respect to the data is critical realist, and it is for this reason that the study calls for both top-down and bottom-up analysis of subsets of "information-rich" (Patton, 2002) text responses. The critical realist worldview accepts

many versions of reality in text responses, following inductive reasoning to discern patterns and themes (Mingers, 2004). The researcher recognizes the potential for bias in data analysis; the study was designed to partially offset potential bias by using the NVivo application to conduct much of the deductive (quantitative) data analysis.

The study called for a final synthesis phase, during which results of inductive analysis were compared with criteria for learner participation in workplace training design, providing a framework for balancing potential bias with externally-designed learner input criteria.

Although the researcher has no contact with study respondents, years of analyzing survey comments have generated a sense of "advocacy" for people who write responses to organizational surveys. For the researcher, this is a significant source of potential bias. The study uses impartial processes wherever possible, to provide an objective framework for inductive (qualitative) analysis. Likewise, the criteria for employee contributions to workplace training designs helped to guide the synthesis phase of the study.

**Expertise of the researcher**

The researcher's early career was in systems analysis and design. With more than fifteen years of experience on implementation projects, the researcher developed a keen understanding of the importance of data integrity, and how systems analysis can improve efficiency and accuracy without sacrificing the validity and integrity of the data. The researcher's experience was gained at a time when systems projects had few standards or templates to guide design and development. The researcher gained an early and long-lasting appreciation of the importance of thorough documentation that is intuitive and easy to update as circumstances change.

In more than a decade of work for an internationally-known survey provider, the researcher has mastered and expanded the qualitative analyst role to include sophisticated thematic analysis of focus group and interview data, as well as thematic analysis of large datasets of text responses. A long-standing appreciation of data integrity informs the researcher's analytical approach.

**Conflict of interest assessment**

The researcher made the following commitments to the Institutional Review Board and the survey provider regarding conflict of interest in this study:

The database containing records to be analyzed in this study is owned by my employer, a multi-national human resources consulting firm. As the comments analyst for the firm's organizational survey division, I work with this database daily in the ordinary course of doing my job. Conflicts of interest to be addressed in obtaining permission from my employer to study the database:

1. I will strictly abide by my employer's Code of Business Conduct, which governs access to, and use of confidential and proprietary data. I attest to my commitment to follow the standards set in the Code of Business Conduct annually.
2. It is my understanding that the database has been the subject of academic study in the past, and I will abide by all rules and guidelines governing earlier studies. I will access datasets for the study via the firm's password-protected VPN environment. Datasets will never be removed from that environment.
3. I will never seek payment for time spent on any aspect of this study.
4. The data contains no personal identifying data, but records do contain a sequence number which could be linked to a respondent's email address. I have no access

to processes that would allow me to connect a record to an email address, and I will never seek to obtain or use those processes.

5. I will never provide access to proprietary survey instruments, files or data to anyone outside the firm.
6. The survey provider will never be referred to in connection with this study, and will not be identified in any documents related to the study, including the dissertation itself.
7. I will request permission to use the dataset from the survey provider's Officer responsible for control and oversight of the dataset, who is the Director of Research for the organizational survey unit of the firm. I will abide by his guidelines for selecting and managing data throughout this study.
8. I do not report to the Director of Research. His department does not have oversight or other management responsibility for my work at the firm.

## Chapter 3 Summary

This chapter began with the stated goals of this study: developing a deeper understanding of the complex phenomena that employee survey text responses represent and testing the new idea that employees may be able to participate in workplace training design through text responses to organizational surveys. To the extent that the approach and methodology in this study are sound and employees used their survey text responses to present ideas and suggestions for improving workplace training programs, this study may suggest a practical and effective means of incorporating employee views in designing and improving workplace training.

# CHAPTER 4. DATA ANALYSIS AND RESULTS

## Introduction

This study applied mixed methods in analyzing datasets containing text responses related to workplace training. The research design reflects the critical realist framework in seeking to understand the complex phenomena of text responses, and the underlying contexts that shape and influence them (Clegg, 2005). Data analysis and results are presented in the context of the deductive, inductive and abductive phases of the study, explained in detail in Chapter 3.

## Description of the Sample

Because existing data was used in this study, data select and preparation replaced data collection. The first purposive sampling task was conducted to select datasets for the study, as explained in Chapter 3 and shown in Figure 8. This chapter presents the results of purposive sampling, by describing the datasets selected for the study.

### Characteristics of datasets selected for the study

The quality of a dataset depends on the relevance of its content to the study and on the volume and variety of responses about training. From the database of available surveys, 59 datasets meeting the criteria (US-headquartered organizations conducting census surveys in 2012) were aggregated by industry sector. Industry sector datasets were filtered for the presence of one or more key-words related to workplace training: *train**, *learn**, *course*, *certif**, *licens**, *educa**, *tuition*, *how do I*, *online/on-line/on line*, *computer-based*, *CBT*, *instruct**, where the asterisk identified key-word roots used to

collect as many forms of the word as possible. For *certif**, for example, the root found *certify / certified* and *certificate / certification*. The results of sampling protocol are summarized in Table 4, for industry sectors containing from one to as many as eleven datasets. For each sector, the percentage of text responses selected for the study is compared to the total of text responses.

**Table 4 Source Organizational Survey Datasets Summarized by Industry Sector**

| File Code | Industry | Survey N | Text Response N | Text Response % | Presence of Key-Words | % of Text Responses Selected |
|---|---|---|---|---|---|---|
| FS | Financial Services | 96,947 | 53,890 | 56% | 16,109 | 30% |
| CP | Chemicals / Pharma | 79,375 | 44,593 | 56% | 8,319 | 19% |
| TC | Telecom | 259,622 | 130,887 | 50% | 33,852 | 26% |
| EC | Engineering / Construction | 27,970 | 21,403 | 77% | 4,861 | 23% |
| ME | Media | 43,166 | 29,162 | 68% | 4,957 | 17% |
| PS | Professional Services | 4,201 | 2,139 | 51% | 290 | 14% |
| MN | Manufacturing | 92,992 | 34,054 | 37% | 4,394 | 13% |
| CS | Computer Software / Services | 15,633 | 10,722 | 69% | 1,892 | 18% |
| DL | Distribution / Logistics | 35,743 | 24,709 | 69% | 3,105 | 13% |
| RT | Retail | 77,000 | 33,996 | 44% | 5,128 | 15% |
| RS | Research | 12,151 | 5,404 | 44% | 819 | 15% |
| NR | Natural Resources | 2,893 | 1,467 | 51% | 148 | 10% |
| HC | Healthcare | 32,135 | 12,387 | 39% | 2,219 | 18% |
| PB | Public Service | 12,438 | 6,327 | 51% | 1,623 | 26% |
| TR | Travel / Leisure | 12,862 | 5,402 | 42% | 1,141 | 21% |
| EN | Energy / Utilities | 3,008 | 1,563 | 52% | 213 | 14% |
| OG | Oil and Gas | 3,935 | 1,681 | 43% | 349 | 21% |
| SV | Services | 1002 | 1002 | 100% | 394 | 39% |
| **TOTAL ALL CATEGORIES** | | **813,073** | **420,788** | **52%** | **89,813** | **21%** |

As shown in Table 4, more than 420,000 text responses were filtered for the presence of key-words related to *training*. The datasets accepted for the study contain 89,813 text responses, which is 21% of all responses from the original survey datasets. Responses rates for 18 industry sectors represented by the datasets range from 10% to 38%, which compares favorably with expected findings for the study of 12-15%, as described in Chapter 3.

While some industry sectors were represented by only one survey dataset, several industries likely to view training as a high priority, such as Chemicals / Pharmaceuticals, Financial Services, Telecommunications and Retail, contained as many as eleven datasets. Response rates suggest the importance of training to employees working in these industries; 19% of text responses in the Chemicals / Pharmaceuticals sector contained key-words about training, as did 30% of responses in the Financial Services sector. The training response rate for the Telecommunications dataset was 26%, and for Retail, the training response rate was 15%. The presence of several datasets in these industry sectors suggests a range of business contexts, with the potential for a variety of training experiences.

**Summary of dataset characteristics**

The 89,813 text responses accepted for the study represent 11% of the original survey populations (89,813 divided by 813,073 total survey responses). The survey provider's average survey response rate is 75%; 89,813 responses containing the key-word *training* represents about 8% of the employee population in these organizations (about 1,085,000). The average response length was 117 words, suggesting that

respondents may have provided considerable detail, covering multiple topics or addressing individual topics at length.

## Research Design and Introduction to the Analysis

As explained in Chapter 3, the study followed a three-phase methodology for analysis of text responses. In the first phase, sampling and analysis strategies were applied to identify and validate major themes in response to the quantitative research question framed in the study.

In the second phase, text responses about online workplace training were analyzed in depth, through inductive analysis, to discover "what they meant when they said that." Results were analyzed in response to the study's qualitative research questions, in terms of influences on training transfer, the overall business environment, learning theories and designs, and creative use of the online learning environment.

Abductive analysis evaluated results of inductive analysis in response to the study's overarching research question. Phase two results were analyzed in terms of an emergent design partnership model, to determine the viability of text responses as input into training design.

### Data selection and preparation

Because existing data was used in this study, data selection and preparation were conducted in place of data collection, as explained earlier in this chapter.

### Data analysis

Text responses were analyzed in deductive, inductive and abductive phases, as explained in Chapter 3. Results are presented in the context of the analysis protocols specified for each phase.

**Phase One: Thematic analysis of small datasets.** Small datasets were chosen for thematic analysis, for two reasons. First, their small size could limit their value in identifying themes with word trees, because of the limited number of responses available for display. Second, the low volume of text responses in small datasets facilitates close analysis of every response.

As explained in Chapter 3, it was important to select a variety of industry sectors for thematic analysis, in order to provide breadth of themes for comparison with broader results from deductive analysis. The datasets selected for thematic analysis represent Services, Oil & Gas, Natural Resources, Professional Services, and Energy / Utilities.

Four of the datasets represented industries in which employees may work with heavy equipment or in occupations that pose a risk to safety. It might be expected that *training* in these contexts relates to equipment handling, troubleshooting and safety on the job site. These industries may share the expectation with Professional Services that employees are hired because of their expertise, which could mean that training for new-hires is limited to company-specific standards and procedures. However, close reading of text responses suggested that training has broader importance in these industry sectors than might be expected. Figure 10 displays the results of thematic analysis for these datasets.

Figure 10 Thematic Analysis of Five Industry Sector Datasets

| Industry | Training Response N | Training Response % |
|---|---|---|
| Oil & Gas | 349 | 21% |
| Services | 394 | 39% |
| Energy / Utilities | 213 | 14% |
| Natural Resources | 148 | 10% |
| Professional Services | 290 | 14% |

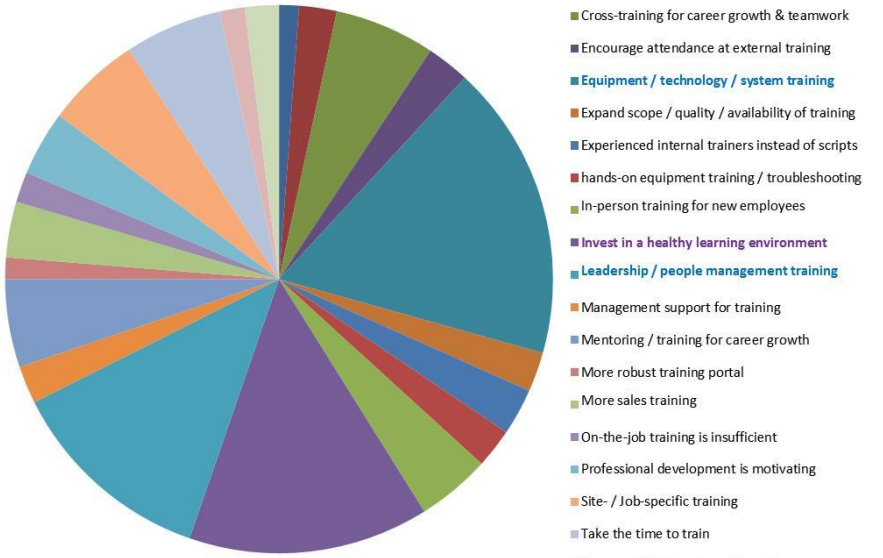



Figure 10 Major themes summarized across five datasets. All text responses in all datasets are closely read and flagged for thematic content. Like and similar references are accumulated and summarized in the graphic and legend.

The most frequent themes are highlighted in the legend, using boldface and the color corresponding to segments in the chart. While training on equipment, technology and systems has the highest frequency across all industry sectors, other important themes include the need for leadership training, and for investment in the learning environment. Respondents called for cross-training and better information about available training. They discussed the importance of management support and mentoring, and making resources available for attending training programs.

Respondents spoke of training in general, calling for “more training” or “better training” or “safety training” or “hands-on training,” with little discussion of how training

occurs. This might reflect an assumption that "everyone knows what training is," or how it works in an industry context or job site. It might reflect limited delivery modes, such as on-the-job training or classroom-based, new-hire, or safety training.

The general nature of these themes seems more appropriate to policy development than training design. One respondent commented about the importance of cross-training to improve collaboration: "*Education and cross-training across departments to better understand how the company operates as a whole could help to break down the siloes and improve communication across departments*." Another discussed the importance of investing in training as a component of recruiting and retention: "*Hiring, training and keeping the best people should be our largest investment for now and our company's / industry's future*." One respondent spoke in some detail about current training: "*A lot of the training I have received in the past is from trial and error in attempting to do my job. For example, blindly navigating in systems that I have read-only access to, or from asking a peer/supervisor*." While this comment provides some insight into current needs, its focus suggests the importance of a training solution without identifying a medium or the content of training that would address those needs.

The following general conclusions describe the tone and content of text responses about training in the five small datasets:

1. ***Training is urgently important to respondents***, to raise quality, develop skills, and prepare employees for career growth.
2. ***Training does not receive sufficient support from leadership.*** Comments call on leaders to "take the time to train," by providing staffing levels and budgetary support to enable employees to attend training.

3. ***"Training" is a concept everyone understands.*** Most responses addressed training as a general concept, with limited description of materials, media and process of training.
4. ***"Hands-on" and troubleshooting are essential.*** Responses expressed frustration that organizations rely on trial-and-error, or help from colleagues, for some of the most important types of training, such as troubleshooting and safe use of tools and equipment. Responses made it clear that hands-on practice is essential, and formal training is the best way to pass on quality and safety standards.

**Phase One: Word inventories.** Building an inventory of all words used in all text responses, for each industry sector, was the first step in developing major themes related to workplace training. The text mining application NVivo was used to create word lists by frequency, showing all forms of every word encountered in each industry dataset. For example, the word *train* includes the forms *training*, *trainer*, *trains*, and *trained*. The listing for each industry sector presents all words, with forms of the words and a total frequency for all forms, for every word appearing in each dataset.

Figure 11 presents an excerpt of the listing for the Retail dataset. The word with the highest frequency is *company*, because company names were masked during data preparation for the study; this is the most frequently used word in most of the datasets. Words such as *employees*, *management*, *customers* and *getting* could be expected to appear frequently in comments about the work environment, but one of the highest-frequency words was *needs*, suggesting an urgent tone in a response. Another frequent word was *timings*, suggesting a potential response theme.

**Figure 11 Excerpt from Word Inventory for Retail Industry Sector**

| Word | Length | Count | Weighted Percentage (%) | Similar Words |
|---|---|---|---|---|
| companys | 8 | 6191 | 2.09 | companie, companies, company, 'company, company', companys |
| works | 5 | 5003 | 1.69 | work, 'work, work', 'work', worked, working, 'working, workings, works |
| employees' | 10 | 4764 | 1.60 | employee, 'employee, employeed, employees, 'employees, employees', employees' |
| trains | 6 | 4586 | 1.54 | train, 'train, train', trained, 'trained, trained', training, 'training, training', 'training', trainings, trainning, trains |
| managment | 9 | 4483 | 1.51 | managable, manage, 'manage, manageable, managed, 'managed', manageing, management, 'management, management', 'management', managements, managent, manager, manager', 'manager', managers, 'managers, managers', managers', manages, managing, managment, managments |
| timings | 7 | 3007 | 1.01 | time, 'time, time', 'time', timed, timely, times, times', timing, timings |
| customers' | 10 | 2936 | 0.99 | custom, custome, customer, 'customer, customer', 'customer', customers, customers', customers', customize, customized |
| getting | 7 | 2427 | 0.82 | get, 'get, 'get', gets, getting, 'getting |
| feels | 5 | 2334 | 0.79 | feel, feel', feeling, feeling', feelings, feels |
| needs | 5 | 2308 | 0.78 | need, 'need, need', needed, needing, needs, 'needs, needs' |
| likes | 5 | 1980 | 0.67 | like, like', liked, likely, likes, liking |
| making | 6 | 1898 | 0.64 | make, 'make, makes, making |
| peoples | 7 | 1832 | 0.62 | people, 'people, people', peoples |
| jobs' | 5 | 1770 | 0.60 | job, 'job, job', 'job', jobs, jobs' |
| ones | 4 | 1678 | 0.57 | one, 'one, one', ones |
| stores | 6 | 1537 | 0.52 | store, 'store, store', stored, stores, stores', storing |
| think | 5 | 1475 | 0.50 | think, thinking, thinks |
| also | 4 | 1467 | 0.49 | also |
| years | 5 | 1438 | 0.48 | year, 'year, year', yearly, years, years' |

Figure 11 Word Inventory is the result of a dataset query run by NVivo, to itemize all words in the dataset with frequencies, and listing all forms of the word detected in the dataset.

Isolating these and other key-words from word inventories that might appear in the context of training, was the next step in developing major themes. As shown in Table 5, *needs* and *timings* were among the top three most frequently-used words across all datasets. While it is not possible from these listings to determine whether these words were used in the context of training, their very high frequencies recommend them for further analysis. Table 5 shows that words such as *career*, *opportunity*, *develop* and *helps* also appeared frequently.

Table 5 Most Frequent Key-words Potentially Related to Training, by Industry Sector

| Industry Code | Industry | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| FS | Financial Services | train | learning | timing | need | opportunity | new | career | positive | role | development |
| CP | Chemicals / Pharma | train | timing | need | new | develops | changing | performs | taking | customized | thinks |
| TC | Telecom | customer | train | timing | need | services | liking | taking | calls | new | knows |
| EC | Engineering / Construction | train | project | timing | needs | develops | betterment | opportunity | providing | supports | new |
| ME | Media | customer | training | needs | timing | managing | making | calls | new | serving | products |
| PS | Professional Services | training | timing | need | practice | making | development | new | hours | learn | opportunities |
| MN | Manufacturing | train | needs | timing | getting | making | new | customized | liking | learns | products |
| CS | Computer Software / Services | training | time | need | getting | making | develops | learns | new | better | taking |
| DL | Distribution / Logistics | train | getting | timing | need | making | knows | changing | betterment | think | positives |
| RT | Retail | train | timing | getting | needs | likes | making | think | hours | helps | pays |
| RS | Research | training | times | needs | engineers | making | new | getting | change | likes | provide |
| NR | Natural Resources | training | needs | time | better | making | communication | integration | class | process | products |
| HC | Healthcare | times | needs | trains | getting | nursing | making | new | taking | changing | knows |
| PB | Public Service | training | needs | times | examiners | making | customized | new | pays | knows | better |
| TR | Travel / Leisure | training | times | instructors | needs | making | experiment | school | taking | think | new |
| EN | Energy / Utilities | training | need | development | times | make | getting | performing | processes | career | new |
| OG | Oil and Gas | training | need | time | development | new | operators | locations | helps | projects | making |
| SV | Services | training | need | customers | industry | make | development | continue | service | better | opportunity |

*Note.* Top ten most frequently-appearing words potentially related to training, with words in the column headed '1' being most frequent, and words in the column headed '10' being least frequent. Compiled from word inventories by industry sector.

**Phase One: Purposive sampling to select key-words for word trees.** The next step in developing major themes was to isolate key-words potentially related to training, as shown in Table 6, which displays the most frequently used key-words, by frequency, within industry sector. The column titled *Presence of Key-Words* displays the total count of text responses for each industry sector, making it possible to compare the frequencies of key-words with the total number of responses in the dataset. For example, forms of the word *learn* appeared 6,330 times in 16,109 responses for Financial Services. While *learn* can appear in a variety of contexts – "*I wish my boss would learn how to manage people*" – this word could have broad applicability for a range of issues that respondents might raise about workplace training.

**Table 6 Summary of Key-words and Frequencies for Purposive Sampling**

| Industry Code | Industry | Survey N | Text Response N | Text Response % | Presence of Key-Words | % Selected for Study | Key-words and Frequencies by Industry Sector | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | Train / Training / Trainer / Trained | Learning / Learn / Learned | Time / Timing | Need / Needs / Needing / Needed | Opportunity / Opportunities | development / develops | betterment | skills | knowledge / knowledgeable | online |
| A | Financial Services | 96,947 | **53,890** | 56% | **16,109** | 30% | **9822** | **6330** | **4589** | **4251** | **4020** | **2474** | **1943** | **1938** | **1516** | **689** |
| B | Chemicals / Pharma | 79,375 | **44,593** | 56% | **8,319** | 19% | **8224** | **1649** | **5088** | **4519** | **1637** | **2629** | **1630** | **967** | **696** | **264** |
| C | Telecom | 259,622 | **130,887** | 50% | **33,852** | 26% | **42458** | **6525** | **28181** | **22755** | **5684** | **5666** | **8191** | **3814** | **3106** | **2244** |
| D | Engineering / Construction | 27,970 | **21,403** | 77% | **4,861** | 23% | **5061** | **503** | **1732** | **1524** | **1088** | **1341** | **1266** | **379** | **200** | **196** |
| E | Media | 43,166 | **29,162** | 68% | **4,957** | 17% | **3787** | **918** | **2129** | **2188** | **586** | **668** | **1226** | **338** | **314** | **267** |
| F | Professional Services | 4,201 | **2,139** | 51% | **290** | 14% | **198** | **88** | **157** | **142** | **88** | **92** | **69** | **32** | **23** | **3** |
| G | Manufacturing | 92,992 | **34,054** | 37% | **4,394** | 13% | **3322** | **1127** | **1815** | **2320** | **644** | **1046** | **1052** | **494** | **357** | **194** |
| H | Computer Software / Services | 15,633 | **10,722** | 69% | **1,892** | 18% | **1238** | **519** | **710** | **702** | **328** | **535** | **433** | **295** | **153** | **88** |
| I | Distribution / Logistics | 35,743 | **24,709** | 69% | **3,105** | 13% | **3000** | **918** | **1941** | **1698** | **506** | **290** | **1054** | **362** | **202** | **54** |
| J | Retail | 77,000 | **33,996** | 44% | **5,128** | 15% | **5015** | **865** | **3007** | **2308** | **745** | **873** | **1171** | **410** | **416** | **344** |
| K | Research | 12,151 | **5,404** | 44% | **819** | 15% | **765** | **140** | **467** | **436** | **152** | **177** | **184** | **62** | **64** | **24** |
| L | Natural Resources | 2,893 | **1,467** | 51% | **148** | 10% | **117** | **27** | **63** | **87** | **12** | **30** | **44** | **4** | **12** | **4** |
| M | Healthcare | 32,135 | **12,387** | 39% | **2,219** | 18% | **1401** | **512** | **1610** | **1490** | **410** | **275** | **471** | **182** | **173** | **37** |
| Q | Public Service | 12,438 | **6,327** | 51% | **1,623** | 26% | **1483** | **287** | **1002** | **1100** | **225** | **179** | **459** | **152** | **119** | **40** |
| R | Travel / Leisure | 12,862 | **5,402** | 42% | **1,141** | 21% | **783** | **185** | **646** | **517** | **165** | **165** | **252** | **126** | **63** | **57** |
| S | Energy / Utilities | 3,008 | **1,563** | 52% | **213** | 14% | **149** | **45** | **91** | **128** | **47** | **105** | **42** | **20** | **19** | **6** |
| U | Oil and Gas | 3,935 | **1,681** | 43% | **349** | 21% | **443** | **58** | **159** | **215** | **31** | **115** | **69** | **37** | **35** | **4** |
| X | Services | 1002 | **1002** | 100% | **394** | 39% | **335** | **27** | **51** | **145** | **51** | **60** | **51** | **13** | **12** | **3** |
| **TOTAL ALL CATEGORIES** | | **813,073** | **420,788** | **52%** | **89,813** | **21%** | **87,601** | **20,723** | **53,438** | **46,525** | **16,419** | **16,720** | **19,607** | **9,625** | **7,480** | **4,518** |

*Note.* Top ten most frequently-appearing words potentially related to training, with frequencies by industry sector.
Compiled from word inventories created by industry sector.

Analysis of these key-words and frequencies provided a basis for selecting key-words for the next step in top-down analysis of large datasets, word trees, which present key-words within the context of five-word phrases immediately preceding and following them. Word tree analysis is a targeted method for identifying relevant themes from many thousands of phrases.

As shown in Table 6, the most frequent words related to training across all industry sectors were forms of *train* (frequency=87,172), *time* (frequency=53,438) and *need* (frequency=46,525). Analysis of text responses for the five small datasets suggested that *time* is often discussed in terms of "not enough time," for example, to complete work, or to attend training, themes that appeared in close analysis of the five small datasets. One of those respondents wrote, "*I know that several co-workers have made attempts to get training that will help them become better technicians but have been told there is no money or time*." This example suggests that *time* is a critical issue, one respondents were well aware of, given their responsibility for transferring what they learn to their jobs.

Although the word *need* suggests a variety of contexts, an example from thematic analysis of small datasets suggests how *need* was used in comments about training: "*I feel there is always room to increase the level of learning within a company. I think that we sometimes need to take the time to train and learn a bit more, and sometimes we get caught in just getting the job done, and take the on-the-job training route more than we have to*." This and other examples from thematic analysis of small datasets show how *need* reflected urgency in a response, confirming the importance of this key-word for word tree analysis.

Table 6 shows frequencies for forms of *learn* (frequency=20,723), with its obvious applications to training issues; *opportunity* (frequency=16,419), and *better / betterment* (frequency=19,607). While *opportunity* can appear in a variety of contexts, for example, related to career development, the high frequency for *better / betterment* deserves analysis, because of its potential connection with learner attributes and self-efficacy.

Because of its importance for this study, *online* is included in Table 6, and is selected for word trees, despite low frequencies reported for most industry sectors. Low frequencies may reflect the possibility that other words were used to describe online training in particular workplaces (e.g., computer-based training, intranet, or an acronym such as LMS, for learning management system, or CBT, for computer-based training), or the reality that online learning continues to be one of several options for training in many workplaces. ASTD's (2013) *State of the Industry Report* shows that, although online learning continues to grow as a percentage of all training, for 2012, the most recent year for which data are available, online training comprises only 27% of all training in the workplace.

**Using the word inventory for purposive sampling for deductive and inductive analysis.** Figure 12 displays the results of purposive sampling for three analysis tasks in the deductive and inductive phases of the study. By grouping key-word frequencies in green, red and blue borders, Figure 12 illustrates the selection of datasets for thematic analysis, of key-words for word trees, and of responses containing online for inductive analysis. Purposive sampling in both phases was achieved through analysis of word inventories, which enabled consideration of the size and variety of industry sectors, for

thematic analysis, and the relevance and frequency of key-words, for word trees and inductive analysis.

Figure 12 Purposive Sampling for Deductive and Inductive Analysis

| Industry Code | Industry | Survey N | Text Response N | Text Response % | Presence of Key-Words | % Selected for Study | Key-words and Frequencies by Industry Sector: Train / Training / Trainer / Trained | Learning / Learn / Learned | Time / Timing | Need / Needs / Needing / Needed | Opportunity / Opportunities | development / develops | betterment | skills | knowledge / knowledgeable | online |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| A | Financial Services | 96,947 | 53,890 | 56% | 16,109 | 30% | 9822 | 6330 | 4589 | 4251 | 4020 | 2474 | 1943 | 1938 | 1516 | 689 |
| B | Chemicals / Pharma | 79,375 | 44,593 | 56% | 8,319 | 19% | 8224 | 1649 | 5088 | 4519 | 1637 | 2629 | 1630 | 967 | 696 | 264 |
| C | Telecom | 259,622 | 130,887 | 50% | 33,852 | 26% | 42458 | 6525 | 28181 | 22755 | 5684 | 5666 | 8191 | 3814 | 3106 | 2244 |
| D | Engineering / Construction | 27,970 | 21,403 | 77% | 4,861 | 23% | 5061 | 503 | 1732 | 1524 | 1088 | 1341 | 1266 | 379 | 200 | 196 |
| E | Media | 43,166 | 29,162 | 68% | 4,957 | 17% | 3787 | 918 | 2129 | 2188 | 586 | 668 | 1226 | 338 | 314 | 267 |
| F | Professional Services | 4,201 | 2,139 | 51% | 290 | 14% | 198 | 88 | 157 | 142 | 88 | 92 | 69 | 32 | 23 | 3 |
| G | Manufacturing | 92,992 | 34,654 | 37% | 4,394 | 13% | 3322 | 1127 | 1815 | 2320 | 644 | 1046 | 1052 | 494 | 357 | 194 |
| H | Computer Software / Services | 15,633 | 10,722 | 69% | 1,892 | 18% | 1238 | 519 | 710 | 702 | 328 | 535 | 433 | 295 | 153 | 88 |
| I | Distribution / Logistics | 35,743 | 24,709 | 69% | 3,105 | 13% | 3000 | 918 | 1941 | 1698 | 506 | 290 | 1054 | 362 | 202 | 54 |
| J | Retail | 77,000 | 33,996 | 44% | 5,128 | 15% | 5015 | 865 | 3007 | 2308 | 745 | 873 | 1171 | 410 | 416 | 344 |
| K | Research | 12,151 | 5,404 | 44% | 819 | 15% | 765 | 140 | 467 | 436 | 152 | 177 | 184 | 62 | 64 | 24 |
| L | Natural Resources | 2,893 | 1,467 | 51% | 148 | 10% | 117 | 27 | 63 | 87 | 12 | 30 | 44 | 4 | 12 | 4 |
| M | Healthcare | 32,135 | 12,387 | 39% | 2,219 | 18% | 1401 | 512 | 1610 | 1490 | 410 | 275 | 471 | 182 | 173 | 37 |
| Q | Public Sevice | 12,436 | 6,327 | 51% | 1,623 | 26% | 1483 | 287 | 1002 | 1100 | 225 | 179 | 459 | 152 | 119 | 40 |
| R | Travel / Leisure | 12,862 | 5,402 | 42% | 1,141 | 21% | 783 | 185 | 646 | 517 | 165 | 165 | 252 | 126 | 63 | 57 |
| S | Energy / Utilities | 3,008 | 1,563 | 52% | 213 | 14% | 149 | 45 | 91 | 128 | 47 | 105 | 42 | 20 | 19 | 6 |
| U | Oil and Gas | 3,935 | 1,681 | 43% | 349 | 21% | 443 | 58 | 159 | 215 | 31 | 115 | 69 | 37 | 35 | 4 |
| X | Services | 1002 | 1002 | 100% | 394 | 39% | 335 | 27 | 51 | 145 | 51 | 60 | 51 | 13 | 12 | 3 |
| TOTAL ALL CATEGORIES | | 813,073 | 420,788 | 52% | 89,813 | 21% | 87,601 | 20,723 | 53,438 | 46,525 | 16,419 | 16,720 | 19,607 | 9,625 | 7,480 | 4,518 |

Green border: Five small sectors purposively selected for thematic analysis in Phase One

Red border: Key-words selected for word trees across all industry sectors, in Phase One deductive analysis

Blue border: Purposive sample of all text responses containing the key-word online, for Phase Two inductive analysis

Figure 12 Top ten frequently-appearing words potentially related to training, with frequencies by industry sector. Compiled from word inventories created by industry sector.

**Word trees of selected key-words.** Word trees display the four or five words immediately preceding and immediately following the key-word. The phrasing and tone of the word strings suggests themes and the tone of text responses. Major themes can be framed by scanning for commonalities and unique responses, and comparing phrasing and tone from one industry sector to another.

As part of analyzing word trees by industry sector, excerpts were created to show the breadth and depth of context in phrases preceding and following key-words. These

word tree excerpts are presented in Figures 13 to 19, showing key-word phrases grouped by topic.

Because *training* has the highest frequency across all industry sectors, its word trees contained many thousands of lines. Word trees displayed all occurrences of phrases for *training*, many of which were difficult to interpret in terms of themes (e.g., "*same lines as this is*"). Phrases of interest mention topics related to *training* – such as time, materials, instructors, online; or training topics, such as standards, products or safety – frequently, and in a variety of contexts.

**Figure 13 Word Tree for *Training – "critical to my job"***

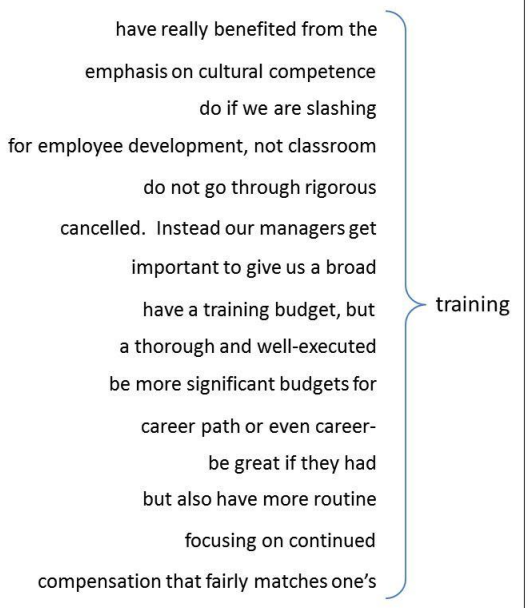



Figure 13 Excerpt from a dataset query run by NVivo, to display references to a key-word in the word tree format.

**Figure 14 Word Tree for *Training – "critical to my job"***

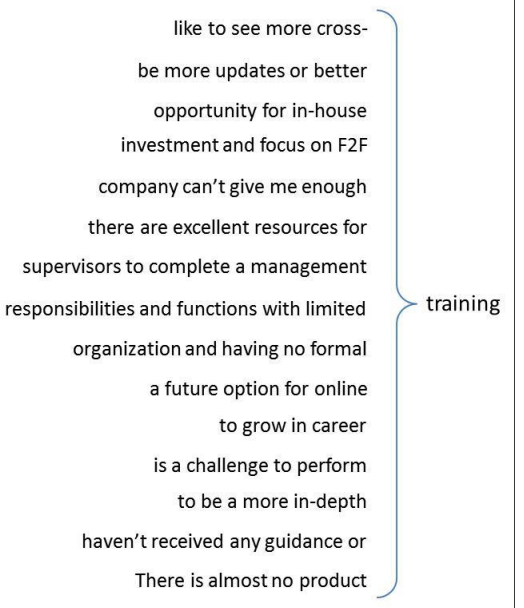



Figure 14 Excerpt from a dataset query run by NVivo, to display references to a key-word in the word tree format.

Responses did not describe particular training events, but rather the factors that influence training at work. In most cases, the tone of responses seemed constructive, even when they were critical of training programs at work, although phrases such as "*I find it a waste*" appeared in many datasets.

Major issues raised about training included management support ("*Encourage employees to gain outside*"), content ("*it was too much information*"), time ("*have time to pursue extra*"), available resources ("*budgets are not talked about*" and "*we have so few people*"), and satisfaction ("*one of the best*" and "*a thorough and well-executed*"). As shown in Figures 13 to 16, while the ideas expressed in key-word phrases varied, the intensity of the responses suggest that training is taken seriously, and respondents were aware of its potential impact on their role and their future at work.

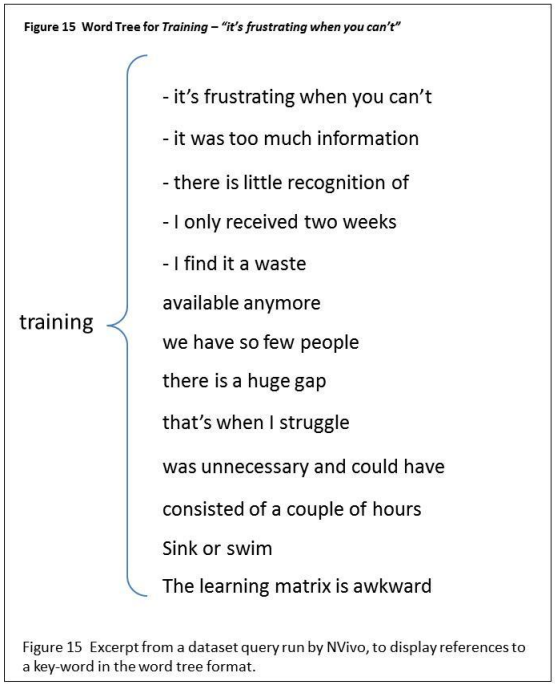



Figure 15 Excerpt from a dataset query run by NVivo, to display references to a key-word in the word tree format.

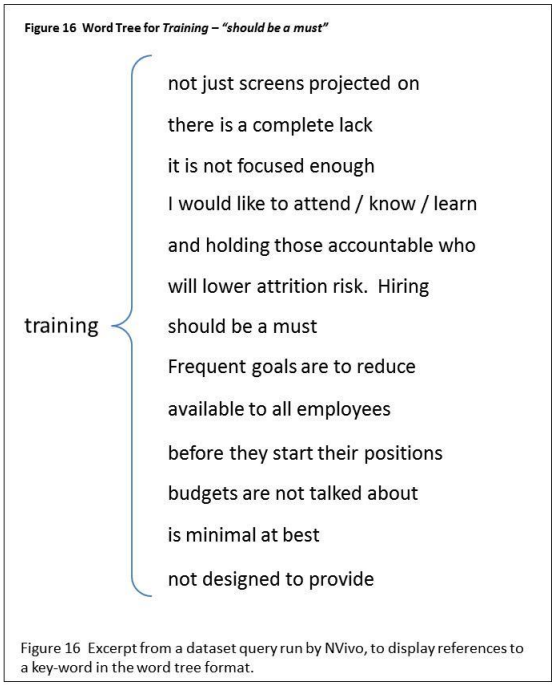



Figure 16 Excerpt from a dataset query run by NVivo, to display references to a key-word in the word tree format.

In a variety of contexts, "*it's frustrating when you can't*," and "*critical to my job is*," suggest personal investment in the outcome of training. Major topics raised across industry sectors, such as training budgets, management training for supervisors and an option for online training, also demonstrate personal investment in workplace training.

**Figure 17 Word Tree for *Learn***

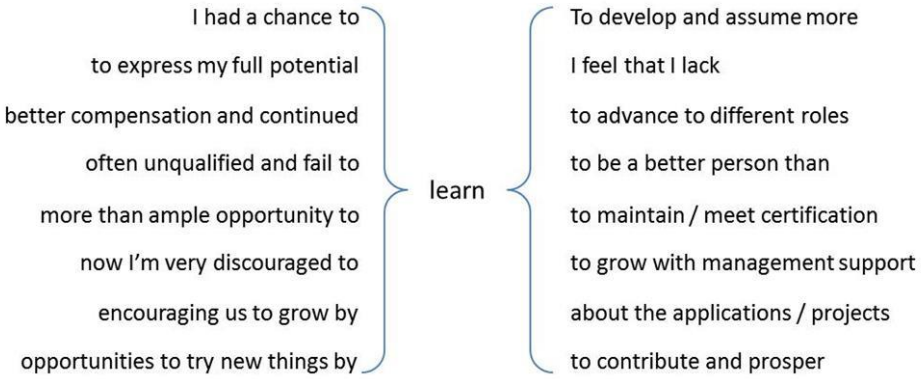



Figure 17 Excerpt from a dataset query run by NVivo, to display references to a key-word in the word tree format.

Word tree phrases for *learn* and *need* appear consistent with learner motivation and obstacles to success, as shown in Figures 17 and 18. Phrases for *learn*, in particular, expressed personal issues, such as *learning* "*to try new things*," and *learning* "*while I'm contributing to my*." Responses described roles in the workplace in terms of "*understand the different ways people*" *learn*, and "*challenging projects and opportunities to*" *learn*.

**Figure 18 Word Tree for *Need***

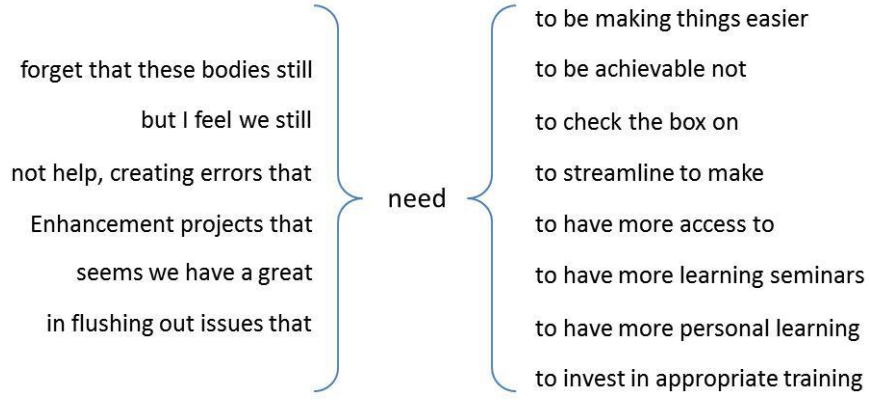



Figure 18 Excerpt from a dataset query run by NVivo, to display references to a key-word in the word tree format.

The key-word *need* appeared in terms of *needing* "*'back to basics' training on*" and *needing* "*consistent, regular training, perhaps in*." Respondents *need* "*leaders who encourage a mindset*" and "*to have comprehensive training on*."

**Figure 19 Word Tree for *Time***

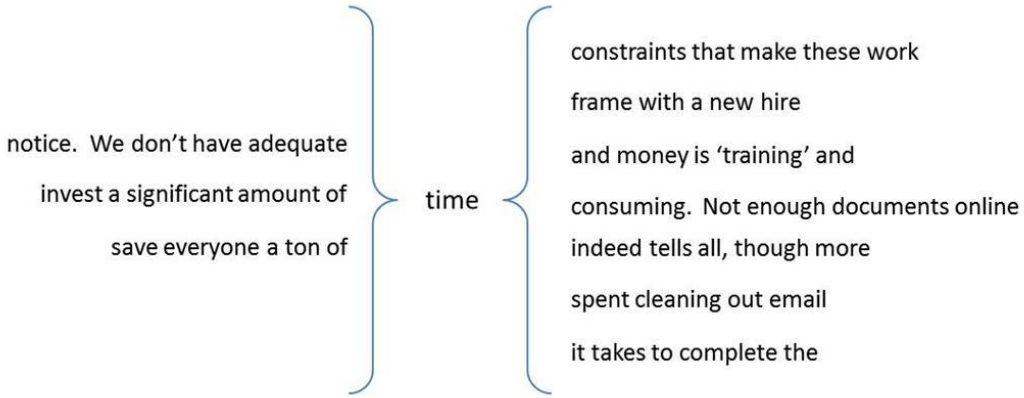



Figure 19 Excerpt from a dataset query run by NVivo, to display references to a key-word in the word tree format.

Word tree phrases for *time* (Figure 19) were about *time* "*constraints that makes these work*" and *time* "*consuming. Not enough documents online*." Responses said they "*don't have adequate*" *time*, and described the *time* "*it takes to complete*."

Phrases for *skill* related to self-improvement, as *skills* "*obtained through continued study*" and "*advancing one's technical or other*" *skills*. The key-word *skill* was mentioned in terms of troubleshooting, and statistical and analytical skills, such as "*advancements to improve our technical*" s*kills*. There was a significant emphasis on management skills, such as "*method of developing one's managerial*" *skills*, and "*are undertrained in people management*" *skills*.

Word tree phrases for *opportunity* related to career growth, such as "*advance and searching for future*" *opportunities*, *opportunity* "*to learn and share*," and "*technical expertise should get an*" *opportunity*.

Phrases for *better / betterment* focused on *better* as a form of improvement, rather than the concept of *betterment* in terms of self-image and motivation. For example, *better* "*calibre of employee*," and *better* "*career opportunities*." Other examples include, "*but these resources could be*" *better*, and *better* "*myself, room for advancement*."

**Word trees: online.** Given the expanded role for employees as learners in using the online learning environment, as discussed in Chapter 2, it might be expected that text responses would offer details about the online training experience, and how it could be improved. Word trees for *online* (Figures 20 to 23) provide examples.

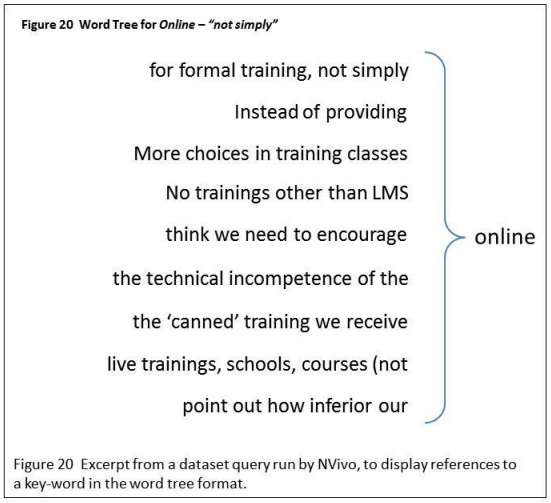



Figure 20 Excerpt from a dataset query run by NVivo, to display references to a key-word in the word tree format.

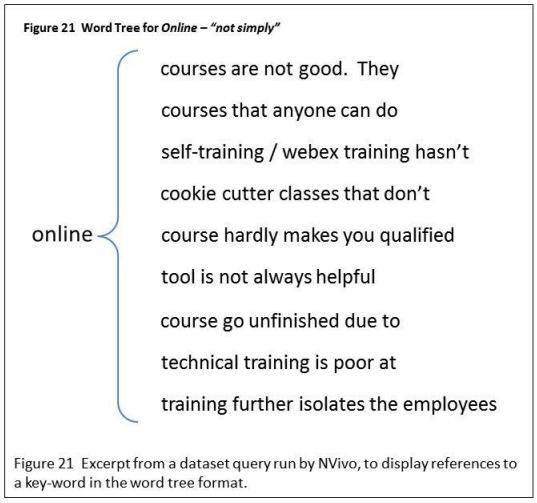



Figure 21 Excerpt from a dataset query run by NVivo, to display references to a key-word in the word tree format.

While key-words in context suggest strong feelings, the brief phrases appearing in word trees communicate only indirectly the details about individual experiences of online training. For example, "*include access to new technology*" *online*, or *online* "*training further isolates the employees*," suggest limited links between online training programs

and other online resources. An *online* "*class that they click through*" seems like a passive experience but does not provide enough detail to understand the problem, or solve it.

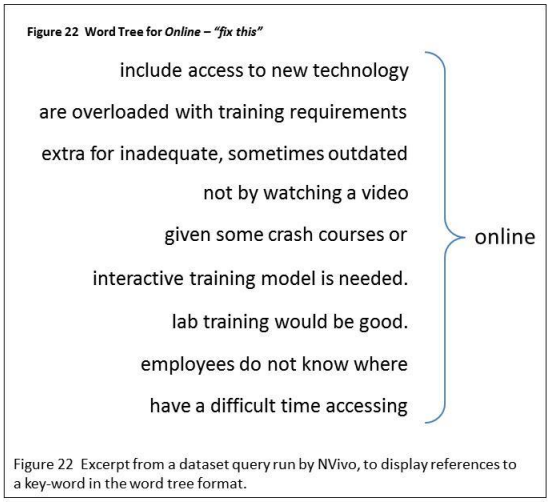



Figure 22 Word Tree for *Online – "fix this"*

Figure 22 Excerpt from a dataset query run by NVivo, to display references to a key-word in the word tree format.

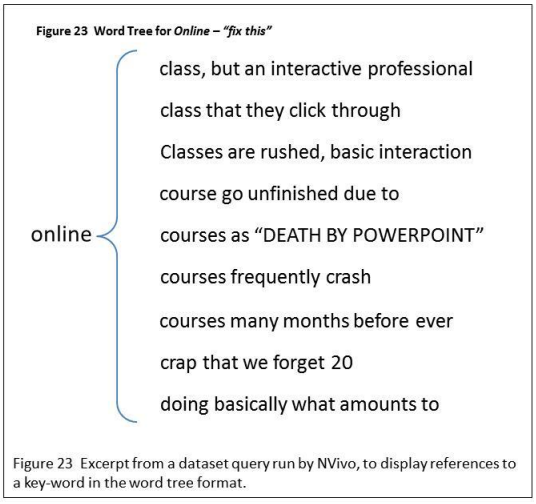



Figure 23 Word Tree for *Online – "fix this"*

Figure 23 Excerpt from a dataset query run by NVivo, to display references to a key-word in the word tree format.

A phrase like "*for formal training, not simply*" *online,* or "*No trainings other than LMS*" *online*, or "*the 'canned' training we receive*" *online*, suggest that online training was seen as – or, in fact, delivered as – less valuable than other training programs.

On the other hand, "*creative problem solving . . . maybe an*" *online*, or "*think we need to encourage*" *online*, or "*More choices in training clas*ses" *online*, suggest that in some environments, online training was seen as a valuable resource. Phrases such as "*not by watching a video*" *online*, "*employees do not know where*" *online*, and *online* "*courses go unfinished due to*" suggest that online training was implemented in ways that caused frustration rather than meeting training needs. A phrase such as *online* "*class, but an interactive professional*," or "*lab training would be good*." *online,* suggest ways of mixing online learning and interaction between employees and subject matter experts.

The text responses containing these phrases might also contain details about employees' experience of online training, especially given the average response length of

117 words, and employees' greater responsibility in managing their training experience in the online environment. Selecting the subset of potentially "information-rich" responses (Patton, 2002) that contain the key-word *online* was the final step in purposive sampling, in preparation for Phase Two of the study.

**Phase One results: Major themes.** Six major themes were identified through deductive analysis, in response to the quantitative research question: *What are the most frequent themes relating to workplace training programs that appear in organizational survey text responses?* These themes are described in the context of Phase One deductive analysis:

1. ***Training should have a high priority in the workplace***. This theme was evident in the percentage of responses about training in organizational surveys, ranging from 10% to 38% across 18 industry sectors. The importance of training also appeared in thematic analysis of five industry sectors, with 17% of responses calling for more training in specific skill areas, and 14% for more investment in a healthy learning environment. The importance of workplace training appeared in key-word-in-context phrases calling for "*more significant budgets*" for training, and stating that training "*should be a must*."
2. ***Time is an essential resource in workplace training***. *Time* was the second most frequent key-word across all responses, with 53,438 mentions. In key-word in context phrases, responses described time as a scarce resource, for example, in "*don't have adequate*" *time*, *time* "*it takes to complete*" and *time* "*consuming*". Thematic analysis of five industry sectors found frequent mentions of formalizing charge codes for training so employees can attend. Responses pointed out that on-

the-job training is frequently less effective than taking the time for training, and they observed that "*trial and error*" – intended to conserve time – is actually time-intensive compared with training. Responses noted that both on-the-job and "*trial and error*" learning are more likely to instill poor and inefficient practices than more formal training.

3. ***The workplace training environment falls short of meeting employees' needs***. *Need* is the third most frequently-used key-word, used 46,525 times across all text responses. Responses identified inadequate training budgets, weak and out-of-date training materials, workload that prevented employees from attending training programs, and lack of management support for training. Key-words in context suggested priorities that actually limit training, in phrases such as "*do if we are slashing*" *training*, "*Frequent goals are to reduce*," and *training* "*budgets are not talked about*." Results were similar in thematic analysis of five industry datasets, with calls for expanded and higher quality training programs, more availability and more management support of training programs.
4. ***Employees are motivated to learn at work***. *Learn* was the fourth most frequent key-word across all responses, with 20,723 mentions in 89,813 responses. Responses described training in terms of "*I had a chance to*" *learn*, "*to express my full potential*". They described learning in terms of "*opportunities to try new things*" and "*encouraging us to grow*." This level of personal commitment was predicted by Bandura (2002), who observed that the ability to adapt to changing circumstances is fundamental in the "rapidly evolving cyberworld" (p. 2) that most employees inhabit. According to Bandura (2002), effective people respond to

ongoing change by developing "skills in regulating the motivational, emotional and social determinants of their intellectual functioning" (p. 4). Thematic analysis of five small sectors identified many themes reflecting motivation to learn, including calls for more training in skill areas; for more time available for training; for cross-training for career growth; and for mentoring and management support for training.

5. ***Skills have the power of currency in the workplace***. Responses described *skills* in terms of self-improvement and opportunities at work, with training viewed as an essential medium for acquiring and building skills. Key-words used in the context of *skills* included *opportunity* (16,419 mentions), *better / betterment* (19,607), and *develop / development* (16,720). Thematic analysis of five small sectors identified skills development as the primary objective of training, in themes that called for more training in particular skill areas and linked training with career growth.
6. ***Online training has perceived value but falls short of meeting current needs***. Key-word-in-context analysis suggested that respondents view online training as ineffective in most cases, although many responses described the potential for exceptionally effective training online. As currently experienced, *online* "*courses frequently crash*," "*are rushed*," are delivered "*many months before ever*," and "*courses are not good*." However, responses "*think we need to encourage*" online training, with "*more choices*," "*creative problem solving*" and "*access to new technology*."

To explore more deeply how respondents experience online training at work, datasets containing the key-word *online* were selected through purposive sampling for inductive analysis in Phase Two.

**Phase Two analysis overview.** Deductive analysis developed the theme that *online training has perceived value but falls short of meeting current needs*. Purposive sampling was used to create a dataset of text responses containing the key-words *online* and *training,* to explore respondents' experience of online training in more detail. As explained in Chapter 3, inductive analysis involved close reading of all responses containing the key-word *online*, and coding of responses in the context of influences on training transfer, using the categories of indigenous knowledge, learner attributes and self-efficacy.

Table 7 presents an overview of results of this phase, with coding frequencies summarized by elements within the categories of influences on training transfer. For each element in each category, several examples of response themes are presented to illustrate themes in the context of the comments in which they occurred.

**Interpretation of Phase Two results.** Results are presented in four contexts, as described in the following sections. The first context is influences on training transfer, as anticipated in the research design and explained in detail in Chapters 2 and 3. Three additional contexts were suggested by the content of responses: the overall business environment; suggestions for improving online learning in the context of learning theories and designs, and creative suggestions for use of the online environment.

**Table 7 Analysis of Text Responses**

| Category | Total Coded Responses | | | | | |
|---|---|---|---|---|---|---|
| **Indigenous Knowledge** | **449** | | | | | |
| **Best Practices** | **28** | centralize policies and procedures to improve consistency | central resource for learning tools | centralize change management for consistent roll-out | test online courses with mgrs before rolling out | hands-on live courses available on weekends or evenings |
| **Business Goals & Priorities** | **29** | core strategy does not translate to investment at my level | financial support for education | capture experience of senior level staff to preserve organizational memory | training must be a strategic priority | qualified trainers with real-world experience in chatrooms to support employee skill development |
| **Current Work Flow** | **83** | inadequate training for new products / work flow changes | job aids are too general to support new products / work flow changes | multi-tasking required during online training, cognitive overload lowers work quality and inhibits learning | training is inconsistent with work flow practices | training materials are out of date |
| **Obstacles** | **106** | deadlines have to be reasonable | safety online training systems are antiquated, require significant manual interventions to keep them running | training is not taken seriously - "data dump in the form of an online course" | policies / procedures are self-contradictory | narrow focus in online learning limits applicability across job roles |
| **Regulations & Constraints** | **14** | work hours are not available for legally required safety training | inconsistent updates regarding changes in regs | more training around compliance | SOP documents are out of date | unable to use licensing training for continuing education credit |
| **Skills & Competencies** | **189** | more vendor certifications in online training | wikis need to be up to date, avoid duplication | online advanced library should be available | a forum with feedback on how tools are implemented and used | training for standards requires more time than allowed, and needs to cover questions and troubleshooting |
| **Learner Attributes** | **377** | | | | | |
| **Context - Situation** | **237** | nuts-and-bolts training with real-world examples of upset customers | under-staffing significantly affects our ability to attend training | more user-friendly intranet | more online self-help (videos, quiz) | training should involve networking with employees in other regions |
| **Culture** | **5** | it would be great to have a forum that allows and encourages creatives to get together, discuss and share ideas that are not necessarily associated with current projects - essentially a way to have discussions with like-minded people in similar job positions as a way to learn and grow | culture change requires a full commitment supported by robust training | culture should encourage collaboration and innovation and reward extra effort | culture should support consistently excellent customer interactions | executives disconnected from the impact of RIFs |
| **Learning Styles - Multiple Intelligences** | **112** | online learning is "the most boring and soulless way of learning in existence" | hands-on training for tool sets | online access to information is better than ops and pos manuals | "you cannot learning a programming language by copying and pasting code and following instructions that tell you everything or nearly everything you need to do" | training should be more hands-on and with real-life situations |
| **Media Preferences** | **20** | prefer to study away from the office with online secure media | desk drops turn into scrap paper | training DVDs could be shared with others | add audio to online training | |
| **Prior Knowledge** | **3** | little to no prior knowledge of customer history complicates customer service | longer-serving employees are so thankful for higher quality training in the past | new employees receive little to no training on technology framework | | |

**Table 7 Analysis of Text Responses**

| Category | Total Coded Responses | | | | | |
|---|---|---|---|---|---|---|
| **Self-Efficacy** | **479** | | | | | |
| **Career - Job Attitudes** | **157** | should have a minimum annual requirement for learning and development | online career advancement tools geared toward specific career paths | more opportunities to advance | online tools to assist with career advice are great | manager support to manage limited training budget and allocate training time |
| **Manager Support** | **102** | leaders could be held more accountable for developing coworkers' goals and achievements | senior members of the team treat learning sessions as a painful thing to do, extremely discouraging to new hires | training doesn't happen because too much red tape around billing / cost centers | no guidance for skill development | we have a client deadline and no roadmap for using systems |
| **Motivation to Learn** | **84** | weekly knowledge sessions, like a chat room, where people could post questions or view pre-recorded videos | "if you're going to make this an important part of people's jobs, get a room with computers set up for each person and take them step by step through their own projects. That way, when questions come up, they can resolve it. Sitting through one of those training sessions and then going back to your desk to do it are very different things." | we have lost our ability to effectively learn - no mentoring, no hands-on - we end up with openings that cannot be filled | lack of preparation for new work is demoralizing | we are micro-managed instead of prepared |
| **Self-assessed Training Needs** | **101** | I know my knowledge gaps but am not able to choose training to meet my needs | I can't get my questions answered | LMS is "just online training" - "it is hard to get the answer when I have a question and sometimes the answer isn't pertinent to my region" | unless we use training content it is difficult to retain data on hundreds of technical slides on unfamiliar topics | a training partner to support online video training in prep for certifications |
| **Self-in-Role** | **23** | doing an online class then going out into the field being touted as an expert without actually seeing the equipment in the flesh is a disgrace. The damage and injury that could be caused to myself and others is ridiculous. | my 'exceptional' ratings are due in large part to the outlined policies and procedures that are readily accessible through the intranet, and to online training | "I see people lacking in development because they are not being held accountable due to little oversight of daily tasks" | few opportunities for us to submit ideas and suggestions | manual by email is not training |
| **Work Climate** | **12** | morale is at a new low with inability to afford quality training and staff needed to run a leading / innovative organization | funds for training are never available | goal-setting is from senior management cascaded down, employee development is not a priority | office priorities limit our access to training | mandatory training is unrelated to work responsibilities |

Interpreting results of Phase Two analysis in these contexts addressed the qualitative research questions in this study: *How do employees describe their current experience of training in their workplace? What would employees change to improve training programs in their workplace? What do employees describe as strengths / weaknesses of training programs in their workplace?*

**Phase Two results: Training transfer context.** Results shown in Table 7 are discussed in more detail according to the three categories of influences on training transfer.

*Indigenous knowledge (phronesis)*. Text responses displaying evidence of the practical knowledge of the workplace that would be employees' daily experience, but would be difficult for outsiders to know, were coded to elements in this category. In addition to best practices, regulations and constraints, and business goals and priorities, this category included current work flow, the idiosyncratic procedures and processes within which employees do their jobs; and obstacles, which could include reporting relationships and technology as well as red tape and structural delay.

The category includes respondents' perception of their own skills and competencies, which may be reflected in their ability to achieve positive outcomes. Of 1,305 coded responses overall, 449 (34%) refer to aspects of indigenous knowledge, with 189 (42%) referring to skills and competencies, 106 (24%) referring to obstacles, and 83 (18%) referring to current work flow.

Figure 24 Indigenous Knowledge (449 coded responses)

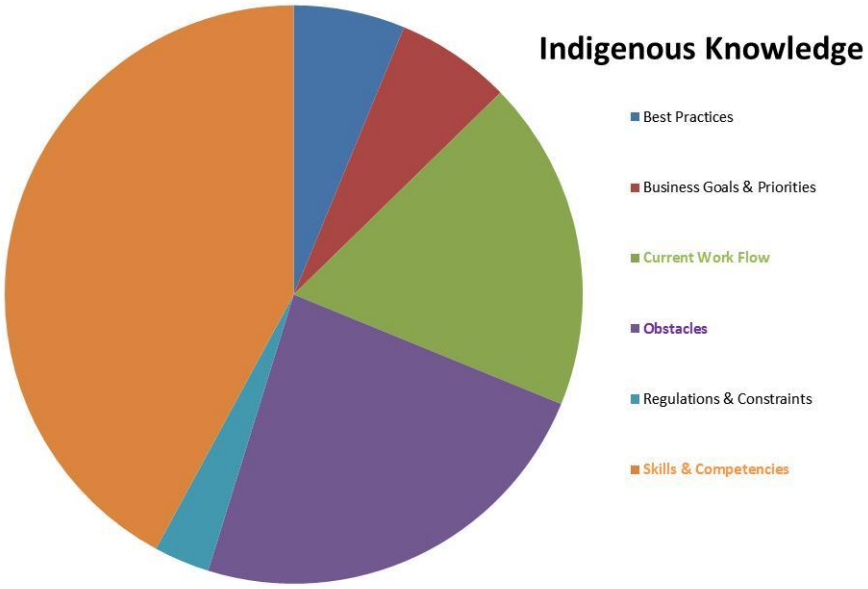



Figure 24 Major themes summarized across all responses containing references to *online*, which are closely read and coded for elements within this category. Like and similar references are accumulated and summarized in the graphic and legend.

Training programs exist in the workplace, according to these responses. The problem is not a lack of training, but the inability of employees to make use of available programs. Responses stated that training programs are of poor quality, they do not keep up with changing conditions, and respondents either do not have time to attend or are unable to spend adequate time on training courses they take. Respondents called for realigning priorities at the highest levels in their organizations, with centralized policies and procedures to improve consistency and centralized access to learning tools. Among best practices, they recommended that managers test online courses before they are rolled out; classroom training should be structured to bundle classes over one or two days, and online courses should be available both during and after work hours.

Above all, they called for an increase in investment in training, to improve quality and scope of training programs and to provide support resources, such as subject matter experts and online resource libraries, to make online training more effective. Here are specific suggestions summarized from references to elements of indigenous knowledge:

- Online chatrooms staffed by subject matter experts to support employees as they learn new skills
- End the requirement for "multi-tasking" during online training courses – for example, the expectation that employees will read and respond to email during training – to support more effective learning
- All product / process changes should be accompanied by training that is available in advance of the roll-out
- Hands-on practice or labs should accompany online training
- Online resources must be kept current, and reference materials for online training must be available
- Online training should not occur through "desk-drops", email attachments, or "click through" questionnaires to satisfy compliance
- Invest in upgrades for online training systems that are buggy / that crash
- More online training leading to certifications
- Ease timeframes / deadlines for online training to provide time for completion
- Adapt language in standards (SOP) to accommodate ESL employees

*Learner attributes: Cultural filters*. These characteristics reflect the employee's immediate work environment, as opposed to the best practices and business priorities that

affect the organization overall. Also included are the individual's own learning strategies as expressed in media preferences and learning styles, and prior knowledge that may shape day-to-day choices and decision-making.

Figure 25 Learner Attributes (377 coded responses)

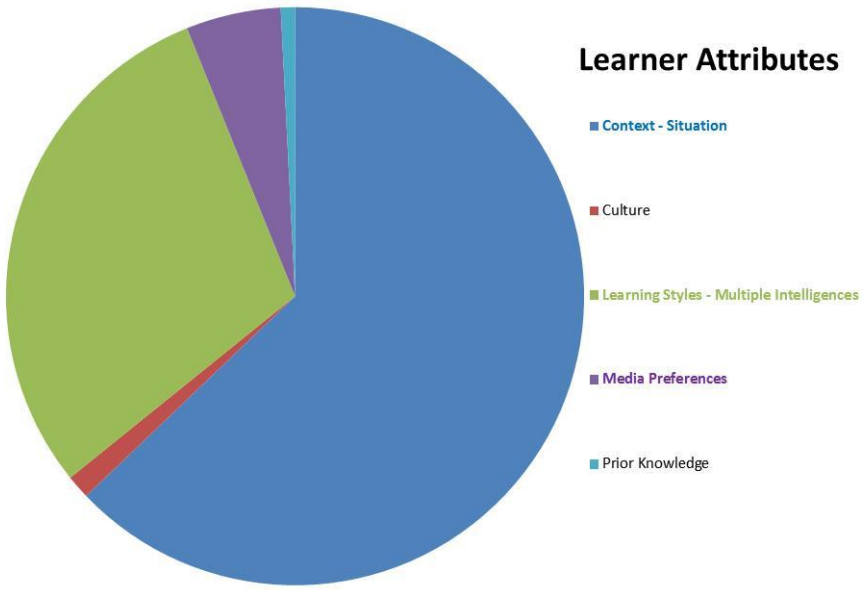



Figure 25 Major themes summarized across all responses containing references to *online*, which are closely read and coded for elements within this category. Like and similar references are accumulated and summarized in the graphic and legend.

Of 1,305 coded responses, there are 377 (29%) references to learner attributes, with 237 (63%) referring to the context / situation and 112 (30%) referring to learning styles / multiple intelligences. Respondents believed a better online training experience includes conversations – with peers, with employees in other parts of their organizations, and with subject matter experts – to share real-world experiences and success / failure stories, especially in the context of new products, equipment and processes. They suggested a variety of means for improving the interactions that would prepare them for "real-world" problem-solving:

- it would be great to have a forum that allows and encourages “creatives” to get together, discuss and share ideas that are not necessarily associated with current projects – essentially a way to have discussions with like-minded people in similar job positions as a way to learn and grow; online technical discussion forums are excellent
- culture should encourage collaboration and innovation and reward extra effort
- hands-on training for new products and tools; training should be more hands-on and with real-life situations; training is needed to support troubleshooting
- "*you cannot learn a programming language by copying and pasting code and following instructions that tell you everything or nearly everything you need to do*"
- more online self-help (videos, quiz)
- training should involve networking with employees in other regions
- online training with workshops
- learning environment is needed to support employees scattered around the country
- include “real-world” successes and failures in training
- videos followed by Q&A work best

*Self-efficacy: Personal agency*. This category includes aspects of personal motivation, including attitudes toward job and career, self-assessed training needs, experience of the work climate and manager support, and level of engagement, or “self-in-role”. These are elements of self-efficacy, the individual’s experience of confidence in

the ability to achieve a positive outcome that strongly influences a person's willingness to undertake and persist in challenging tasks.

Figure 26 Self-efficacy (479 coded responses)

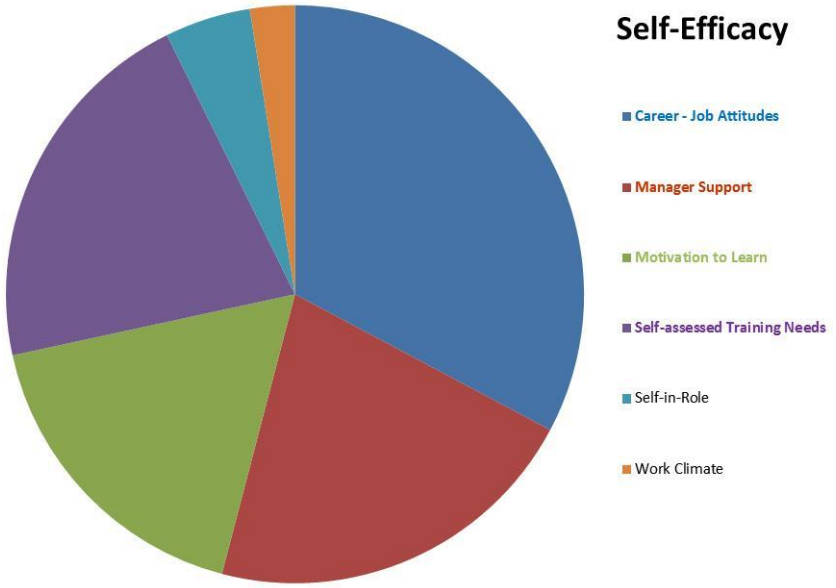



Figure 26 Major themes summarized across all responses containing references to *online*, which are closely read and coded for elements within this category. Like and similar references are accumulated and summarized in the graphic and legend.

Of 1,305 coded responses, 479 (37%) refer to aspects of self-efficacy, with 157 (33%) referring to job and career attitudes, 102 (21%) referring to manager support, and 101 (21%) referring to self-assessed training needs. Respondents viewed training as "*the best defense against the coming wave of change*" – they were well aware of the empowering impact of skills on building a career. They said that employee development was not a priority in their organizations – indeed, that retention of talented staff was not a priority. They say that morale was low, and while some viewed online training as demotivating, most said that training is a path to growth that "allows employees to grow

in new ways." In the words of one respondent, "*we have to have skills we can be proud of, please give us time and skills*."

Among their specific comments within the context of self-efficacy, respondents offered the following suggestions and observations:

- online career advancement tools geared toward specific career paths; online tools to assist with career advice are great
- not investing to develop talent is limiting innovation; organizations maintain only a weak link between career growth and training
- respondents are embarrassed by lack of training and lack of manager support
- weekly knowledge sessions, like a chat room, where people could post questions or view pre-recorded videos
- desire to learn should be matched by direction and ability to apply what is learned
- it costs much more to lean on other employees than to be trained on new products
- hurry-up-and-do-it makes learning impossible

**Phase Two Results: Overall environment context.** Text responses analyzed in this study come from several industry sectors that depend on training to manage change, introduce new products and technology, and maintain compliance with regulatory requirements, such as Telecommunications, Chemical / Pharmaceuticals, Retail and Computer Software / Services. While some organizations in this study may view training as a strategic priority, text responses from their employees suggest low levels of investment and management support for training programs.

Operating in the disruptive economic and cultural climate described in Chapter 1 of this study, all of these organizations experience an accelerating rate of change that may

at any time be reshaped by unexpected and even catastrophic events, such as extreme weather or geopolitical conflicts. Their ability to adapt is these organizations' best defense against disruptive change, an ability that depends in large part on the adaptability of their employees (Clark & Gottfredson, 2008). According to their text responses about training, employees in these organizations viewed training as a weakness that left them vulnerable and affected the quality of their work.

The ability to continuously adapt to changing conditions is a capacity Clark and Gottfredson (2008) refer to as *agility*, "the ability to grow, change, or innovate at or above the speed of one's own market" (p. 4). Clark and Gottfredson describe agility in terms of five factors: the environmental context, learning mindset, leadership behavior, learning technology and organizational support (2008, p. 5). From text responses it was clear that employees were well aware of the value of adaptability. Lack of preparation left them demoralized; they said, "We have to have skills we can be proud of, please give us time and skills," and "We have lost our ability to effectively learn – no mentoring, no hands-on." In responses about online training, employees suggested improvements that address the five factors of agility set out by Clark and Gottfredson (2008, p. 5), as discussed below.

*Environmental context* – the relative stability of the industry, as well as larger patterns, trends and disruptions. As discussed, the current environment is characterized by unstable markets and disruptive change coming from unexpected sources, such as geopolitical strife and extreme weather. Employees experience disruption in terms of staff reductions, whether through layoffs or talented staff leaving for better opportunities elsewhere. The impact on employees of a disruptive external environment is evident in

increasing workload with fewer staff to shoulder the work, limiting their available time for balancing work with their personal lives. Attending training is a casualty of the disruptive environment, as respondents observe that morale is at a new low with inability to afford quality training and staff needed to run a leading / innovative organization.

*Learning mindset* – assumptions about how people learn, learning habits in the organization and general perceptions of roles within the organization, the "paradigm of the period," and at the same time "the willingness to challenge that paradigm" (Clark & Gottfredson, 2008, p. 5). Respondents were forthright in their perception that skills are a form of currency in the workplace and training is essential for building skills, and they expressed discouragement over the current state of training in their workplace:

- I know my knowledge gaps but am not able to choose training to meet my needs
- "Doing an online class, then going out into the field, being touted as an expert without actually seeing the equipment in the flesh, is a disgrace. The damage and injury that could be caused to myself and others is ridiculous."
- Mandatory training is unrelated to work responsibilities
- Lack of preparation for new work is demoralizing
- Desire to learn should be matched by direction and ability to apply what is learned

*Leadership behavior* – the predominant leadership model in the organization. Many respondents saw their leaders as disconnected from the realities of day-to-day operations:

- Core strategy does not translate to investment at my level
- Senior members of the team treat learning sessions as a painful thing to do, extremely discouraging to new hires

- Training doesn't happen because too much red tape around billing / cost centers
- Leaders undervalue employees
- We are embarrassed by lack of training, lack of manager support
- Managers do not support adequate annual training budget

*Learning technology* – the standard of technology widely available for training. Respondents described technology as outdated and inflexible, offering limited options online:

- LMS is "just online training" – "it is hard to get the answer when I have a question and sometimes the answer isn't pertinent to my region"
- Online learning is "the most boring and soulless way of learning in existence"
- Listening to an SOP and completing an online test isn't learning
- Training content doesn't reflect our business practices
- Online courseware is buggy, software crashes
- Training materials do not reflect known issues / troubleshooting
- Online training is "death by PowerPoint"

*Organizational support* – infrastructure in place to support learning and transfer of learning into day-to-day procedures and processes. Respondents expressed dismay at the lack of time available for training, and the expectation that they would "multi-task" during online training programs. Some noted that training accomplishments were not recognized or rewarded; many saw the lack of manager support for training attendance as evidence of the low priority for training in the organization.

**Phase Two Results: Context of learning theories and designs.** Employees called for real-world problem-solving, interaction with peers and subject matter experts, and use of multi-media in online training. These are familiar suggestions to learning theorists and training designers alike, as discussed in Chapter 2.

For example, in his meta-analysis of learning models, Merrill (2002) identified five principles that are necessary for learning to take place: task-centered, authentic problem-solving; connection with learners' prior knowledge, and demonstration, application and integration of new knowledge (pp. 44-45). Jonassen (2000) emphasized the importance of solving real-world problems that may be ill-structured and lack a clear path to resolution. Employee suggestions for improving online training reflect and validate these principles based on real-world experience in a variety of industries:

- Online training should provide: hands-on experience, a chance to ask questions, problem-solving
- Nuts-and-bolts training with real-world examples of frustrated customers
- Need to learn from real-world successes and failures
- Videos followed by Q&A work best

**Phase Two results: Creative use of the online learning environment.** Respondents suggested expanding the scope and quality of training at work, for example, by mixing training methods in order to provide scaffolding to support and enhance online learning:

- A training partner to support online video training in prep for certifications
- Weekly knowledge sessions, like a chat room, where people could post questions or view pre-recorded videos

- Online career advancement tools geared toward specific career paths; recommended course sequence for career path
- Cross-training to support upskilling for current role
- Training for growth areas of the company - allow employees to grow in new ways
- It would be great to have a forum that allows and encourages "creatives" to get together, discuss and share ideas that are not necessarily associated with current projects - essentially a way to have discussions with like-minded people in similar job positions as a way to learn and grow
- Hands-on training for tool sets; online training with workshops; training should be more hands-on and with real-life situations
- Add audio to online training
- Online access to information is better than ops and pos manuals; online advanced library should be available
- More online self-help (videos, quiz); videos followed by Q&A work best
- Training should involve networking with employees in other regions; online technical discussion forums are excellent

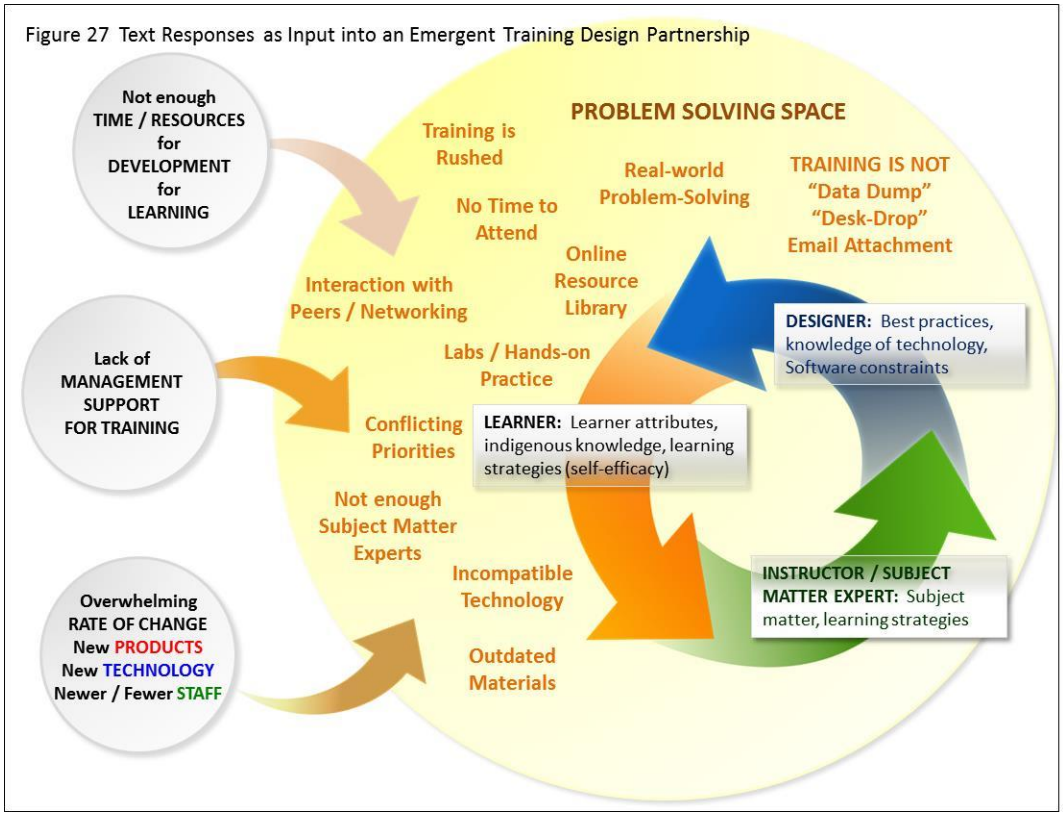
**Phase Three results: Interpretation in the context of emergent training design partnership**. The synthesis research question in this study asks: *To what extent does employee feedback about workplace training meet the criteria of input into workplace training design?* The criteria of input into workplace training design are defined through the emergent training design partnership, as ill-structured problems introduced by members of the collective, whose activities, based on individual experience and their own

logic (Kays & Sims, 2006), governed by "local rules" (Johnson, 2001), generate together resolutions that none of the members could have arrived at by themselves.

Phases of deductive and inductive analysis discovered evidence that points to ill-structured and even "wicked" problems observed by employees in a variety of industry sectors. Some text responses appear to identify "wicked" problems in the workplace, such as conflicting priorities, that result in a lack of manager support and scarce resources for developing and delivering training. Do conflicting priorities reflect leaders struggling to reconcile short-term financial reporting with the demands of the market for delivering new products? Is a lack of time and resources evidence of conflicting priorities, or of overwhelming change, with more new products and new technology than the organization can deliver?

The emergent training design partnership suggested in this study provides a problem-solving space that supports the collective in struggling with ill-structured problems by working through the members' individual contributions and choosing best alternatives from those that are available.

Figure 27 depicts the problem-solving space and the emergent training design partnership, showing how the problems raised in text responses analyzed in this study could be brought into the collective for clearer definition and selection of alternatives. It is the hope of the study that this design supports "think[ing] about learning in the online environment rather than simply how to design instruction" (Kays, 2003, p. 127).




## Chapter 4 Summary

The overarching research question defined in this study asks, *"To what extent do text responses contained in organizational survey data represent viable employee/learner input into workplace training design?"* Through deductive and inductive analysis, and through abductive (synthesis) analysis of results, the study suggests that there is evidence of employees acting as agents of change in responding to organizational surveys. Text responses analyzed in this study offered constructive suggestions, often with insightful observations about the learning context in their organizations. This is good news for organizations that conduct surveys, and should be good news for employees as well.

# CHAPTER 5. CONCLUSIONS AND DISCUSSION

## Introduction

Perhaps the most disconcerting comment encountered in this study was one that closed with the observation that, "you can't ask a computer a question." This employee must experience online training that makes the most limited possible use of the versatility and creative power we all experience, when we use computers to connect with online search engines, converse with friends through social media, shop online for cars or shoes or homes or groceries, or look online for the best movie to see on a Friday night.

We ask our computers questions every day, all the time, and our computers respond in as little or as much detail as we request, through powerful and sophisticated operating systems and software applications that use the immense resources available through the Worldwide Web. Our interactions with computers are as rich and varied as any in our lives. Many of us regard our computers as colleagues (Fogg, 1997); we seek and often take their advice, in response to questions and more questions we pose in our ongoing conversations with this highly sophisticated and interactive technology (Crawford, 2003).

The respondent who "can't ask a computer a question" is describing a broken interaction with an online training system, similar to the broken interaction between teachers and learners posited by Black and Wiliam (2009) in their model of formative assessment. Adapting this model to the respondent's predicament with computers (Figure 28), we see that training content delivered by the computer is not necessarily

what the employee understands, and therefore the employee's response, for example, on a quiz question, is rejected by the computer as wrong.

The employee who "can't ask a computer a question" turns away from this broken interaction more frustrated than ever, by an experience that was supposed to prepare him or her to use new equipment, work with customers, solve problems, or carry out the complex tasks of his or her job.

Figure 28 Broken interaction between employees and online training

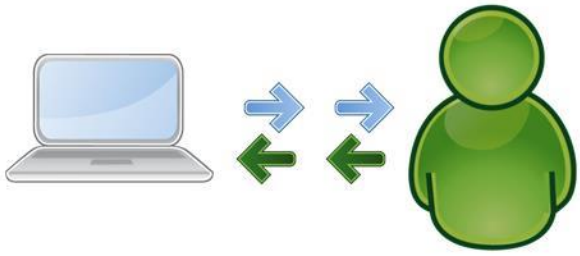


Figure 28 The model shows multiple points of broken communication between learners and online training. The training content is not necessarily understood by the learner, and the learner's response may then be unexpected, resulting in a response the learner doesn't expect from the training. Interpretation based on "Developing the theory of formative assessment," by P. Black and D. Wiliam, 2009, *Educational Assessment, Evaluation and Accountability, 21* (1), 5-31.

The interaction between a person and a computer relies on the framework of conversation, the oldest form of learning known to human beings, a "cyclic process in which two actors alternately listen, think, and speak" (Crawford, 2003, p. 5). Between people and computers, conversation is carried out through the person's keyboard and mouse, while the computer uses visual and audio displays to respond.

The character and direction of conversation is defined by the person's ability to choose – the person, rather than the computer, "gets to make decisions, to effect choices" that shape the content of the interaction (Crawford, 2003, p. 76).

If the conversation as a medium of learning is applied to online training, with the computer presenting learning materials in response to a person's questions and requests, the interaction is "play" in its best sense – experimentation, "what if" scenarios, driven by the person's questions and more questions, following a conversational path the person may never have dreamed was there (Crawford, 2003, p. 235). Applying this model to educational systems could generate a new paradigm, "by abstracting the process by which the student learns, rather than the material that we wish to teach" (Crawford, 2003, p. 252).

This study responds to the statement, "You can't ask a computer a question," with emphasis: *of course you can*. We need to use our resources more effectively, to shape online interactions that empower this employee to learn, and learn, and learn.

**Summary: Findings and Methodology**

The goals of this study were achieved with respect to both the findings and methodology. Text responses to organizational surveys proved to be a rich resource of experience and ideas that are viable as input into workplace training design, and indeed, respondents pointed out fundamental problems in their organizations that limit effective application of training even when it is essential to reach strategic goals. The mixed methods approach used in this study provided a reliable and replicable methodology that could readily be applied to analyze large datasets for insights about training or other

topics of interest. This section discusses the study's findings and methodology in more detail.

**Findings: Survey text responses are viable as input into training design**

The goals of the study were to develop a deeper understanding of text responses to organizational surveys as complex phenomena, and to test the new idea that employees could participate in design and improvement of workplace training programs through their survey responses. It was expected that general themes would include employees' inability to attend training because of workload, understaffing and lack of manager support, and that respondents would describe training at work in terms of job satisfaction. This expectation was confirmed in the results of Phase One deductive analysis, which established six major themes related to workplace training.

**Summary of Phase One deductive analysis: Six major themes.** Training has a high priority with employees, as shown by significant response rates for text responses about training across 18 industry sectors. Respondents submitted responses that averaged 117 words, discussing the current training context and suggesting improvements in some detail. The most frequent key-words in their responses, in addition to *training*, were *time*, *need*, *learn*, *opportunity* and *develop*.

Deductive analysis found that time is a source of conflict for many respondents, who said they do not have time to attend training, or to learn in training programs they attend. Current training programs do not meet employees' needs for several reasons, among them weak and out-of-date materials and lack of manager support. Despite these difficulties, employees are motivated to learn at work. They recognize the importance of acquiring and building their skills, for current job performance and career advancement.

While employees understand the perceived value of online training, they stated that the programs in their workplace do not meet their needs.

Even at the level of deductive reasoning, it was apparent that employees described "training" in general terms, as though everyone knows what that means, despite the many options for training available in many workplaces. However, comments about online training contained more detail about the training experience, evident even in the top-down analysis conducted in Phase One. This "information-rich" (Patton, 2002) resource was ideal for the bottom-up analysis conducted in Phase Two.

**Summary of Phase Two inductive analysis: Results in four contexts.** Data for Phase Two analysis was selected through purposive sampling, with the intention of creating a dataset containing a few hundred responses. Responses containing the key-word *online* were selected because of the richness of the data that was evident in Phase One analysis.

As discussed in Chapter 2, the richness of responses about online learning is not surprising. The online environment affords employees greater control over their learning experience, similar to other experiences they are likely to have in the online environment. Fogg (2008) found that users of social media "apps" readily interact with developers of those apps, by suggesting changes and improvements; in fact, Fogg's guidance to app designers is to launch a prototype and allow users to guide subsequent efforts to fix bugs and enhance the design.

Text responses in this study suggest that many employees have a similar sense of "ownership" with respect to their online training. Respondents discussed specific aspects that make it difficult for them to transfer learning content to their jobs:

- Several responses mentioned a work requirement to "multi-task" while "clicking through" online training programs, by responding to email and phone calls and other daily tasks. Respondents rightly viewed this requirement as an impediment to learning, undoubtedly with the full support of cognitive load theorists.
- Training is too often delivered as an email attachment, "desk drop" or "data dump", many times on – or after – the day when the training content is needed. Respondents viewed this as much more than an inconvenience, because it left them unprepared for interactions with customers and colleagues. To the extent that learning occurs in the interaction between employees and resources, "desk drops" or "data dumps" suggest a breakdown in understanding how learning takes place.
- Training for new products or equipment must include a hands-on component that enables employees to practice what is being trained. This is another example of a fundamental breakdown in understanding how learning occurs. Respondents state the obvious – it is difficult to learn how to use a tool or piece of equipment without hands-on practice.

These deficiencies suggest organizational conflicts that limit commitment and investment in workplace training – examples of the types of ill-structured problems that should be addressed by the emergent design partnership suggested in this study. While designers and instructors may observe that they are well aware of these problems, it is evident from employees' responses that the problems are not being addressed effectively enough to resolve them. Employees asked to "multi-task" during training sessions have little chance to learn. Whatever the underlying issues may be, this state of affairs, which

is described in several text responses, is antithetical to learning, an obstacle that limits transferring content into changed behavior on the job. Evidence from this study shows how much the voices of employees are needed in training design, to remind designers and others in the collective that the goal of training is not to deliver training. The goal is for employees to transfer training to their work.

Phase Two inductive analysis was expanded to present the data in three contexts beyond the original scope defined for the study. It was expected that employees would discuss training from their perspective, as learners responsible for transferring training content to their jobs, and inductive analysis would therefore present responses in terms of influences on transfer, defined as indigenous knowledge, learner attributes and self-efficacy. These contexts were found to be relevant for many responses which described the training context, respondents' skills and learning styles, learning motivation and career / job attitudes.

Respondents' observations about conflicting priorities in their organizations suggested a second context for evaluating responses about training: their organizations' ability to adapt to an economic and cultural climate of constant and disruptive change. Many respondents gave their organizations weak ratings, with leaders who seemed to be disconnected from day-to-day operations, lack of investment in the infrastructure needed to compete, and lack of organizational support for learning as a core competency.

Responses about weaknesses in online training programs suggested analysis in the context of learning theories and designs. This context is not in the scope of the study and is therefore considered by example. However, it is interesting to note that respondents understand very well that how training is delivered is crucial to their learning experience.

Their suggestions deserve serious consideration as reflections of the highest standards of online training design, expressed by employees who, as learners, have the most to gain from effective online training.

- While some respondents reject video as a learning medium, many others said that narrated demonstration following by questions and answers is an excellent way to learn, reflecting the *multimedia principle*, that "people learn better from words and pictures than from words alone," and the *modality principle*, that "people learn better from graphics and narration than graphics and printed text," and the *worked-out example principle*, that "people learn better when they receive worked-out examples in initial skill learning" (Mayer, 2005, pp. 6-7).
- Respondents calling for chat rooms and networking as part of online training reflect the *collaboration principle*, that people "learn better with collaborative online learning activities" (Mayer, 2005, p. 7).
- Respondents calling for real-world problem-solving reflect Merrill's (2002) "first principles of instruction," centered in authentic tasks, and Jonassen's (2000) problem-solving approach to learning.
- For respondents who think "you can't ask a computer a question," their online training programs require fundamental redesign to incorporate core capabilities of the online experience.

Finally, respondents suggested a variety of enhancements to online training at work, ranging from training partners to support specialized programs to online tools for

knowledge sharing and career advancement, to networking and online self-help resources.

Organizational survey responses about workplace training are viable as input into training design and improvement in three dimensions. First, they provide insights into what works and what does not work now, from the perspective of employees who bear the most responsibility for making training effective on the job. Second, they provide insights into the structural issues that affect training effectiveness, such as conflicting priorities that limit time and resources available for training. Third, they suggest improvements based on how employees learn and what they need to learn in order to adapt to changing conditions at work.

**Summary of Phase Three abductive (synthesis) analysis: Employee participation in training design.** As shown in Phase Two analysis, responses about training in organizational surveys represent a rich source of input into training design and improvement. The emergent training design partnership suggested in this study envisions that employees would participate in training design through regular organization-wide training surveys, as described below in suggestions for further research. Training surveys would afford the opportunity for employees to evaluate their training experiences frequently, commenting on deficiencies and improvements that support them in transferring training to their work. Training surveys might address specific topics targeted for improvement, such as more effective interaction in online training programs, or better management of conflicting priorities, such as time and resources.

**Methodology: A reliable and replicable approach for analyzing large datasets**

The methodology goal of the study is to demonstrate a replicable and reliable mixed methods approach for generating "trustworthy research that is meaningful" (Leech & Onwuegbuzie, 2010, p. 78). The methodology in this study combined purposive sampling and analysis tasks in the deductive and inductive phases to analyze very large datasets across a variety of industry sectors from the top down, and from the bottom up.

Phase One, deductive analysis, began with thematic analysis of a subset of the data, to create a baseline understanding of how respondents across several industry sectors described their experience of training at work. Word inventories and word trees provided tantalizing suggestions of themes, especially those related to *training* and *time* and *need*. Major themes developed through analysis of word trees benefited from comparison with the results of thematic analysis, which provided insights into context well beyond the glimpses available in five-word phrases preceding and following key-words.

From results of thematic analysis of five small datasets, it was clear that *time* was used in the context of "not enough time", for attending or learning from training. Key-words such as *need* and *opportunity* appeared in the context of lack of resources and lack of management support, both for training and career development. It was also clear from these industry sectors that "training" is a general term that seems to require no definition or details. These results were reflected in the phrasing displayed in word trees, which seemed to raise the same issues, in the same language, again and again.

Purposive sampling to create the dataset for inductive analysis rested on two observations that emerged in thematic and deductive analysis. First, it was clear that

comments about *training* were general in nature, on the apparent assumption that everyone knows what "training" is. Selecting a subset for inductive analysis based on *training* might yield similar general statements, essentially replicating the Phase One themes in slightly more detail. Second, comments about *online training* were clearly more detailed, even in the limited phrases displayed in word trees. Given the importance of the online learning context for this study, the key-word *online* was a strong choice for Phase Two analysis.

Analysis in Phase Two was conducted individually for each dataset containing the key-word *online*, and each response was coded by phrase to elements in the structure of factors that influence training transfer. Since most survey prompts requested "one or two things that would most improve your work experience," respondents were not asked for detailed information about their personal training needs, skills assessments or support for training in their work environment. Given this constraint, the quality and level of detail in text responses exceeds expectations of this study and suggests how important this topic is to survey respondents.

Phase Two analysis is bottom-up, meant to find "needle in a haystack" insights describing the current workplace training environment and suggested improvements. However, frequencies are valuable in inductive analysis, because they suggest breadth as well as depth of insight, and provide a means of assessing the relative importance of ideas and experiences across many responses. The database application NVivo, used in this study to code responses according to factors influencing training transfer, reports coding references by frequency, making it possible to analyze data in detail while also reporting how many respondents have similar views.

Phase Three analysis addressed the synthesis research question: *To what extent does employee feedback about workplace training meet the criteria of input into workplace training design?* The quality of data summarized and reported for Phases One and Two make it clear that this question does not go far enough in analyzing the resource available through text responses to organizational surveys. Respondents address current limitations, ongoing needs and options for improving online training in the workplace, and many identify elements of ill-structured and even "wicked" problems likely at the heart of deficiencies in current training programs.

Future research could focus on particular aspects of online training, such as availability of time and other resources, or the quality of online interactions in current programs. Based on their text responses, employees are clearly a valuable resource in working through the complexities of conflicting priorities, incompatible platforms, and the need for hands-on, highly interactive training to prepare employees to deliver new products and work safely with new equipment.

## Limitations

Limitations of the study relate to characteristics of the datasets, which represent 18 industry sectors, with text responses from 59 organizations. No attempt is made to generalize from these responses, as they represent characteristics of individuals in particular circumstances, and the study does not attempt generalization as a goal.

Further study could address industry sectors more broadly, or focus more specifically on the characteristics of a single organization, adding depth and breadth to this body of research.

## Implication of the Results for Practice

The results of this study demonstrate that text responses to organizational surveys are an information-rich resource that can reasonably and reliably be studied for specific input in addressing organizational challenges. Employees appear to take on the role as agents of change in their responses, suggesting valuable ideas in the real-world context of the organizations where they work. Organizations are well-advised to apply the mixed methods approach demonstrated in this study to hear the voices of their employees, and to incorporate their ideas in setting priorities and goals.

## Recommendations for Further Research

The datasets analyzed in this study were based on data available from a widely-used medium for gathering input from employees: the organizational survey. Given the quality of responses obtained from these surveys about workplace training, it is suggested that organizations consider more focused surveys as part of shaping a training strategy.

Focused surveys are frequently conducted on topics such as safety and benefits programs. Employees are invited to act as change agents in shaping organization-wide policy and best practices related to safety at their job sites, or in choosing the most advantageous menu of benefits such as healthcare coverage, and to comment on progress in these areas since prior surveys. Training surveys would not be modeled on "smile sheets" (Kirkpatrick & Kirkpatrick, 2006) that rate reactions to a particular training event. Instead they would ask employees to comment on their training experience overall, using text responses to encourage details about individual perspectives, in the context of the organization's progress toward adaptability in this challenging and disruptive economic

climate. This study affirms the power an organization unleashes when it invites its employees to act as agents of change.

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## APPENDIX. STATEMENT OF ORIGINAL WORK

### Academic Honesty Policy

Capella University's Academic Honesty Policy (3.01.01) holds learners accountable for the integrity of work they submit, which includes but is not limited to discussion postings, assignments, comprehensive exams, and the dissertation or capstone project.

Established in the Policy are the expectations for original work, rationale for the policy, definition of terms that pertain to academic honesty and original work, and disciplinary consequences of academic dishonesty. Also stated in the Policy is the expectation that learners will follow APA rules for citing another person's ideas or works.

The following standards for original work and definition of *plagiarism* are discussed in the Policy:

> Learners are expected to be the sole authors of their work and to acknowledge the authorship of others' work through proper citation and reference. Use of another person's ideas, including another learner's, without proper reference or citation constitutes plagiarism and academic dishonesty and is prohibited conduct. (p. 1)
>
> Plagiarism is one example of academic dishonesty. Plagiarism is presenting someone else's ideas or work as your own. Plagiarism also includes copying verbatim or rephrasing ideas without properly acknowledging the source by author, date, and publication medium. (p. 2)

Capella University's Research Misconduct Policy (3.03.06) holds learners accountable for research integrity. What constitutes research misconduct is discussed in the Policy:

> Research misconduct includes but is not limited to falsification, fabrication, plagiarism, misappropriation, or other practices that seriously deviate from those that are commonly accepted within the academic community for proposing, conducting, or reviewing research, or in reporting research results. (p. 1)

Learners failing to abide by these policies are subject to consequences, including but not limited to dismissal or revocation of the degree.

**Statement of Original Work and Signature**

I have read, understood, and abided by Capella University's Academic Honesty Policy (3.01.01) and Research Misconduct Policy (3.03.06), including the Policy Statements, Rationale, and Definitions.

I attest that this dissertation or capstone project is my own work. Where I have used the ideas or words of others, I have paraphrased, summarized, or used direct quotes following the guidelines set forth in the APA *Publication Manual*.

| | |
|---|---|
| Learner name and date | Kathryn Lloyd Warren March 7, 2014 |
| Mentor name and school | Rod Sims, PhD, School of Education |