

**Measuring e-Learning Program Effectiveness:  
A Stakeholder Approach to Scorecarding Performance**

Brian A. Petersen

A Dissertation

in

The Department

of Education

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## **ABSTRACT**

### **Measuring e-Learning Program Effectiveness: A Stakeholder Approach to Scorecarding Performance**

Brian A. Petersen, Ph.D.  
Concordia University, 2007

The ability of learning executives to understand how effectively their e-learning programs are contributing towards corporate business goals is a necessary and critical activity within organizations today. This research project investigated how different stakeholders within a corporate environment could develop key performance criteria (KPCs) that could be integrated into Thomas Gilbert's (1996) performance requirements model and was used to evaluate the effectiveness of an organizational e-learning program with the result being an e-Learning Effectiveness Index (e-LEI) scorecard. Concept mapping and pattern matching techniques was used in a single case study involving 39 employees that included performance designers, e-learning end-users and managers from a large retailing company to investigate stakeholder variation. End-user of the e-learning program responded through a survey to answer their perceptions regarding the effectiveness of the e-learning program and a scorecard was created called the e-learning effectiveness index (e-LEI). The central focus for the research involved answering the following three questions:

1. What key performance criteria (KPC) could contribute to developing a procedure to measure the effectiveness of an e-learning program within an organization?

2. To what extent do stakeholder groups differ in their perceptions about the KPCs and their importance in evaluating e-learning programs?
3. What and how could key performance indicators (KPI) integrated into Gilbert's performance model be used in the development of an e-Learning Effectiveness Index (e-LEI) scorecard?

The results of the study to question 1 showed that through the use of Trochim's concept mapping procedure, KPCs could be identified and ranked by importance then used as metrics in which to measure the effectiveness of an e-learning program. With regards to question 2, the study found clear differences between stakeholders perceptions on the importance of KPCs used for measurement benchmarks. Finally the results showed in answering question 3 that KPCs integrated into Gilbert's model of performance requirements can be used in the development of a balanced scorecard that provides management with insight on how effective their e-learning programs are operating.



## ACKNOWLEDGEMENTS

My parents, Arne and Elza Petersen emigrated after WWII from Europe to Canada. While I attended grade school in the sixties, I recall my mother's consistent message to me about the value of becoming educated through proper schooling.

My mom would preach to all of us children in the family;

“No matter what happens in the world, someone can take everything you have of value including family, friends, money, possessions and dignity. However, no one can take one important thing you have achieved, that is, getting a very good education. For with that, you can re-build anything from nothing”.

This lesson was both inspirational and motivational in my pursuit to obtain my Ph.D. degree in Educational Technology. I am truly blessed in having my Mom and Dad as fine parents, mentors and friends.

My wonderful wife Betty contributed so much to this achievement. She was always supportive during my many hours working on this research project and she was a fabulous sounding board for me to vent to when the “mountain looked to high to continue to climb”. To Betty my soul mate, I'm most grateful and love you so much!

My three boys; Jordan, Ford and Dack who were extraordinarily patient and tolerant for young children while their father toiled away during week nights and on weekends at school studying. They are truly my greatest possessions on earth!

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## CHAPTER 1

### OVERVIEW

The e-learning market is skyrocketing both within educational institutions and corporate organizations. Sales in this area went from \$197 million in 1998 to \$5.5 billion in 2004 (Moe, 2004). Clearly, organizations see e-learning as a value-add that can favorably impact their business. Benefits include improved workforce effectiveness, reduced training costs, and improved workforce retention (Taylor, 2001). But with any new technological advancement in learning and education comes change and the winds are now blowing! A more recent question has come to the forefront, and corporate executives are currently asking “Are our e-learning programs effective in delivering the benefits we expected?”

This study is in response to the compelling pressures to better understand the effectiveness of e-learning programs within organizations. As Tanquist (2000) noted, “e-Learning evaluations often do not receive the priority that they deserve” (p. 32). Few organizations go beyond “smile” sheets that measure how well trainees enjoyed an e-learning activity. A survey by the American Society for Training and Development (Sugrue, 2002) found that 75% of organizations that were surveyed that had implemented corporate e-learning programs did not go further in program evaluation efforts because they lacked the understanding as to how and what to do next within program evaluation. Evaluating e-learning’s effectiveness is essential, and “all e-learning activities should incorporate at least some form of evaluation” (Tanquist, p. 37). Many practitioners would concur with Bishop (1999) that “...a good deal of effort is still needed to studies devoted

to the evaluation and measurement of how e-learning programs can and do contribute to meeting the organization's strategic business goals" (p. 109).

This study briefly describes the characteristics of effective e-learning programs, identifies existing evaluation models currently being used to evaluate e-learning programs, identifies gaps and weaknesses in those models, and offers a possible solution for better measuring e-learning program effectiveness. There is an urgent need for greater understanding of evaluation models, and more specifically, what metrics one is trying to measure. Clearly, "if you can't measure it, then you can't manage it" echoes through the thoughtful words of quality-process guru Deming (1996) in describing how organizations should view their systemic processes, but it is not clear within e-learning programs as to just "what" we should be measuring. e-Learning program evaluation speaks principally in terms of the purposes, processes, consequences, stakeholders, and contextual issues involved. Taken together, these areas provide both a theoretically and empirically anchored foundation upon which this research aims to build.

My overall basic assumption is that if e-learning programs are going to be effective in delivering the benefits that they set out to provide, then we must do a better job at evaluating e-learning programs so that we can better understand the gaps and areas that need improvement. Based upon this, I propose that learning organizations need to identify and establish benchmarks (performance criteria) within their e-learning programs by which they can measure program effectiveness, followed by the establishment of a framework that includes processes and procedures that multiple stakeholders can use to evaluate the effectiveness of their e-learning programs. Kaplan and Norton (1993) suggested that any proposed performance measurement framework must be capable of



capturing the data and results with an instrument that is understandable (scorecard) and that will aid management in their decision-making process, which in turn can contribute to improving e-learning program effectiveness. The research questions that have evolved for this research include the following:

1. What key performance criteria (KPCs) could contribute to developing a procedure to measure the effectiveness of an e-learning program within an organization?
2. To what extent do stakeholder groups differ in their perception about the KPCs and their importance in evaluating e-learning programs?
3. What and how could key performance indicators (KPIs) integrated in Gilbert's (1996) performance model be used in the development of an e-Learning Effectiveness Index (e-LEI) scorecard?

This study proposes an expanded model for the evaluation of e-learning program effectiveness. It describes an expanded methodology and a supporting set of integrated procedures and processes that are used to measure, analyze, and evaluate e-learning program results. This proposed framework is based on the integration of existing models presented by scholars and will be expanded to fill voids that were left by incomplete evaluation methods. The proposed framework can be adapted and tailored to specific programs and environments. A single case study will be used to provide an example of, and to illustrate, how the tools, templates, and sub-processes involved can be integrated to form a customized view of e-learning program effectiveness.

A major advantage of this approach is that it embraces and integrates multiple program evaluation taxonomies such as formative, summative, and developmental forms. This is done using a combination of methods within a documented framework of

established measures concerned with nine factors of quality, quantity, and cost that Gilbert (1996) noted were necessary for measuring any performance activity. In addition to ensuring that stakeholder views about the most important outcomes and results of an e-learning program are identified and integrated into a set of aligned scorecard measures, substantial stakeholder involvement in the process yields the additional benefit of raising collective organizational knowledge about the true power and possibilities for e-learning in their organization.

Incorporating the strategic view of learning contributing to business results, Petersen (2007) proposes that an expanded evaluation model be used within the overall framework of evaluating program results, specifically for e-learning initiatives (see Figure 1.1).

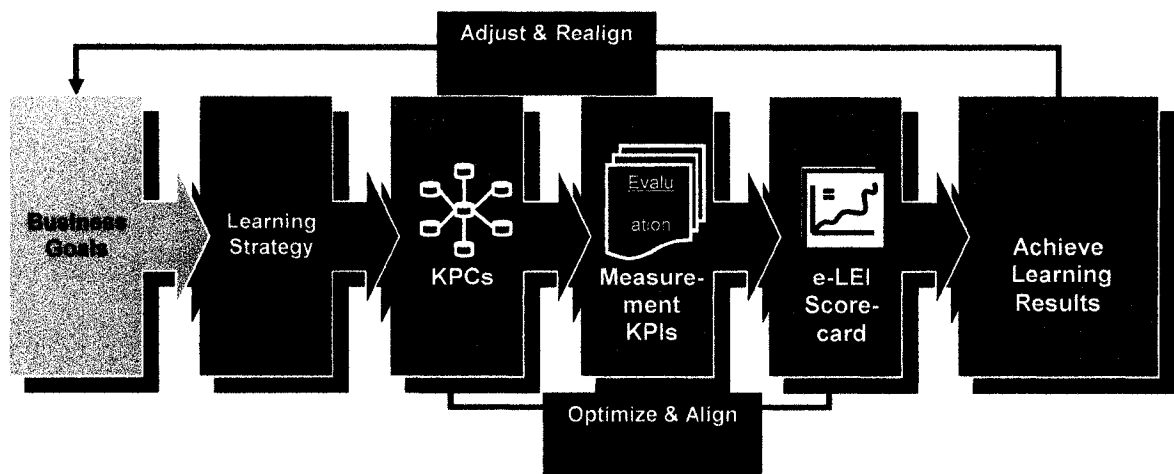


Figure 1.1 The e-Learning Effectiveness Index Scorecard Framework (Petersen, 2007)

This model integrates three important processes within that framework:

1. Defining the KPCs that could be used as metrics to measure and benchmark an e-learning program's effectiveness against.

2. Developing an e-Learning Program Effectiveness survey that will be an instrument to collect end-users' perceptions and reactions to KPIs that measure the effectiveness of existing e-learning programs within an organization.
3. Developing an e-Learning Effectiveness Index (e-LEI) scorecard that will provide management with critical quantitative information on how well different stakeholders within the organization perceive that the e-learning program is measuring up against the defined KPCs.

### The Problem

Organizations are increasingly focusing attention and resources on enhancing the functioning of all their processes, practices, and systems, including their training and e-learning systems. Executive management are seeking ways to ensure that training and development dollars are well spent, that training and in particular e-learning activities are furthering the organization's goals and business drivers by making all employees more productive, and that new e-learning programs within training are an investment in the company (Van Dam, 2003). In recent years, researchers in the training and organizational development fields have provided training managers with several evaluation models and frameworks for program evaluation, based on research into the best practices within organizations, study within training, and evaluation literature, and existing e-learning evaluation practices within the field. These evaluation models provide a framework for the evaluation of e-learning programs and systems, an important achievement in that "an effective e-learning program supports the training function and supports the overall organization in driving towards meeting its organizational goals" (Phillips, 2002, p. 44).

However, there are three gaps within existing evaluation models that require further investigation:

1. What processes are necessary to fully measure and evaluate e-learning programs?

Phillips, Phillips, and Zuniza (2000) stated that “it is imperative to have a comprehensive measurement and evaluation system that improves the actual calculation of e-learning benefits” (p. 35). However, for the process to work effectively, several elements must be present to build a comprehensive evaluation system. Phillips et al. went on to state that the implementation of a comprehensive e-learning measurement and evaluation system will require the following three elements:

- First, there must be a framework to collect and categorize evaluation data into different types and to dictate particular timeframes to predict the data.
- Second, a process model is needed to show how evaluation data is collected and how the effects of e-learning are isolated from other factors so that the model ensures that various options are considered and that data are properly identified, collected, integrated, processed, and reported.
- Finally, operating standards and guidelines are necessary to ensure that each step of the evaluation procedures in the model is consistent from one application to another for the same type of situation.

2. What performance criteria should be used in evaluating e-learning programs?

A comprehensive e-learning evaluation system yields six levels of data: reaction, learning, application, business impact, ROI, and intangibles. Phillips et al. (2000) stated that when determining what to evaluate in a program particularly at Kirkpatrick’s levels four and five, specific performance criteria need to be developed. Furthermore, Gilbert

(1996) commented that all performance criteria must fall within three major class categorizations, which he termed *quality, productivity, and cost* (p. 79). My comprehensive review of e-learning evaluation literature has revealed a limited set of criteria that can be used for measuring e-learning program effectiveness.

3. Within different organizations, do stakeholders hold different perceptions of what constitutes e-learning program effectiveness?

The evaluation of e-learning has been limited by an incomplete understanding of perceptual and expectation differences between key organizational stakeholder groups (Michalski, 1997). This limitation is most apparent in complex organizations composed predominantly of knowledge workers (Senge, 1994) who learn in many ways, being educated professionals with high expertise and specialized roles. Stakeholder-based evaluation has been recognized as useful in conceptually framing the general training evaluation problem (Bryk, 1983). However, most training evaluation models continue to ignore, reduce, or make properly grounded assumptions about the nature and consequences of training evaluation (Lewis, 1996). A significant challenge of training evaluation is the utilization of the evaluation criteria. Evaluation utilization is conceptually linked to the broader domain of inquiry on knowledge utilization.

According to Shulha (1996), “scholars continue to think of the utilization of research findings or training knowledge in instrumental, conceptual, and symbolic terms” (p. 122).

A stakeholder-based approach to evaluation represents an appreciation that each training program affects different groups, which have divergent and even incompatible concerns, by realizing and understanding the diversity of interests at play (Weiss, 1983). Embedded in this diversity issue, however, are problems of conceptual definition. Furthermore, there

are no existing models based on formalized benchmarks or key performance criteria (KPCs) that can be used to evaluate e-learning programs from different stakeholders' perspectives. Therefore, any effort to develop and evaluate stakeholder performance criteria for measuring learning and delivery effectiveness is worthy of further exploration and discussion.

### Rationale for the Study

This research study explores the relationships and differences between *managers* who approve and fund end-user e-learning training, *end-users* (trainees) who benefit from the e-learning programs, and *performance designers* who build the e-learning programs, to determine what key performance criteria can be used in the development of a scorecard for the evaluation of e-learning program effectiveness. The application utilizes concept mapping as an evaluation approach in identifying the KPCs from three distinct stakeholder groups. The data for the study comes from three stakeholder groups who work within the Information Technology department of a large manufacturer and retailer in the United States. This study also evaluates the differences between stakeholder group's perceptions regarding the importance of each key performance criterion identified during the concept mapping activity and attempts to evaluate whether the KPCs can be validated by placing them within Gilbert's model of performance requirements. Finally, a new e-learning program evaluation model was tested by creating an e-Learning Effectiveness Index (e-LEI) scorecard. The aligned scorecard organized critical data based on the KPCs captured through a survey completed by e-learning users and organized it into a qualitative model that was used to benchmark and improve the e-learning program within this case study.

The results of the study have several potential applications for training and e-learning evaluation and practice. Clearly, the study will provide information to top management and training managers at this retailing company to help them gain greater understanding and insight about where to focus the most attention to improve their e-learning programs through the use of an aligned scorecarding process, whose framework is built on their employees' perceptions of key performance criteria that make their e-learning program effective. This study might also be useful to similar organizations that are actively utilizing e-learning as an overall strategy of deploying training to their employees and they are seeking new ways to evaluate their program's effectiveness. Training analysts and practitioners might also find the results useful in their attempts to refine and improve upon existing evaluation and measurement models within corporate training environments.

### Hypothesis and Research Questions

My overall hypothesis is that by employing a multiple perspective approach, interested organizational stakeholders can identify and develop performance criteria that may be used as metrics in the design and construction of an e-LEI scorecard. The aligned scorecard can potentially be a valuable organizational tool in understanding to what extent an e-learning program is delivering what it was intended to deliver in the views of different employees. Only through the establishment of a framework that is systemically organized, that includes multiple perspectives, and that is well documented can corporate stakeholders effectively measure what their e-learning programs were designed for.

Three questions have emerged as important areas of interest within this study.

1. Which KPCs extracted from different corporate stakeholders should contribute to developing benchmarks that could be used to measure the effectiveness of an e-learning program within an organization?
2. To what extent do stakeholder groups differ in their perceptions about the key performance criteria and the importance in evaluating e-learning programs?
3. How could KPIs be integrated into an evaluation process that would contribute to an e-LEI scorecard?

Exploration of these questions has important implications for the measurement and evaluation of e-learning program effectiveness. With clearly defined key performance criteria for evaluating e-learning, organizations can clarify their corporate learning vision through measurable goals and outcomes (Shepko & Douglas, 1998). This vision drives the learning that takes place within the organization, aligns the stakeholders to the organization's overarching business strategy, and reveals their successes. In order to achieve this goal, organizations need to measure what they are doing and how well they are achieving their goals against an initial set of performance criteria or benchmarks (Phillips et al., 2000).

Phillips et al. (2000) suggested that one of the key components to any e-learning evaluation initiative is to have a set of performance criteria, a milestone against which to measure. If the organization does not have pre-defined performance criteria to measure against, the starting point can be difficult to determine. Once performance criteria have been identified from which to benchmark, it is a matter of continuous measurement and analysis against those criteria (scorecarding), which then must be followed by targeted plans to improve post-evaluation program performance.



The following three hypotheses provided the basis for this study:

1. Different stakeholders groups within an organization such as managers, end-users, and performance designers have different opinions / perceptions as to what should be used as benchmark KPCs for e-learning program evaluation and will rank the KPCs differently in terms of their relative importance in contributing to the accurate measurement of an effective e-learning program.
2. Stakeholders can assess and rank the importance of each KPC that was identified in the concept-mapping evaluation in the terms of Gilbert's (1996) Performance Requirements model and be able to validate the extent to which their KPCs meet Gilbert's Performance requirement.
3. KPIs integrated into Gilbert's Performance Requirements model can be used as benchmark metrics to develop an e-Learning Effectiveness Index, which is an aligned scorecard that can provide a framework that represents measurable on-going benchmark metrics that indicate the effectiveness or ineffectiveness of a well designed and executed e-learning program.

#### Contribution to Knowledge

This study synthesizes the research published in the last ten years, drawing out common themes in the study and research of e-learning and e-learning program evaluation. Early findings indicate that organizations are quick to adopt e-learning programs while at the same time many are experiencing substantial failures as outcomes of their programs. Although justifying the value of e-learning is needed (Taylor, 2001), Tanquist (2000) noted that "e-learning evaluations often do not receive the priority that they deserve" (p. 61). Several models for e-learning program evaluation exist. These

include Kirkpatrick's (1994) model, which suggest four levels of evaluation; Phillip's (2005) model for evaluating return on investments (ROI); and Brinkerhoff's (2002) model, which added two additional layers to Kirkpatrick's model to the evaluation process. However, Mungania and Hatcher (2004) commented that these models inform researchers at the highest level in terms of what they should be measuring but that they lack the ability to guide research about what specific variables (performance criteria) should be measured (Question 2) and what methods or procedures might be used to build a framework in which to measure and capture evaluation data in order to make better informed decisions about their e-learning program's effectiveness (Question 3). Michalski (1997) claimed that any evaluation model should include input from multiple stakeholders in the organization and should not be construed from only one stakeholder group (Question 1). Pulling together the literature in this way and combining it with a single organizational study will help efforts leading to the development of an organizational e-learning program evaluation scorecard. This procedure may offer an alternative to organizational education departments in developing e-learning program evaluation plans or adapting existing ones that they have found to be inadequate.

#### Contribution to Practice

The proposed process and procedures for developing and implementing an e-LEI scorecard in this research project will be the primary outcome as an extension of the organizational theories of Beer, Deming, Baldrige, and more specifically Kaplan and Norton (1993) as a continuation of their management system called the "Balanced Scorecard," which are all applicable to a wide range of organizations. Their approach provides a prescription as to what companies should measure in order to balance the

entire organizational perspective. Their Balanced Scorecard suggests that we view organizations from four perspectives, one of which is “learning and growth,” wherein they advocated that an organization develop metrics, collect data, and analyze it relative to each of the other perspectives.

The e-LEI scorecard is a process and a series of procedures that builds upon existing program evaluation models of Kirkpatrick (1998), Gilbert (1996), van Dam (2003), Phillips (2005), and Brinkerhoff (1989) that are widely acknowledged as useful and used in the field of learning-program evaluation today. The e-LEI scorecard is not just a collection of criteria proposed by a group of employees within an organization. Rather it uses their experience and reflections to prioritize broadly-based theoretical and empirical performance criteria, and it serves to make the criteria more precise and to extend them through reflective practical knowledge on how to quantitatively measure the effectiveness of their e-learning programs in terms of what they were intended to do.

Since this study collected input from multiple stakeholders in the development of metrics (key performance criteria) obtained through a concept-mapping procedure, and it was aligned within Gilbert’s Performance Requirements standards, then the model should be transferable and testable in other situations and adaptable to other environments. Whether it is directly transferable to other situations will depend on other research, but I expect the model will resonate with other e-learning program evaluation models existing today. This study will thus offer possible solutions to real questions about what should be measured when evaluating e-learning program effectiveness. The research is timely and the findings should be useful. The research will be consistent in terms of generalizability for a single case study with what Trochim (1990) described as readers determining for

themselves how the results apply to their specific organizational situation. I believe the study will be prescriptive in developing a framework and procedure for identifying performance metrics that can be used to benchmark and measure an e-learning program's results. Corporate management might then be in a better position to make the appropriate decisions on improving organizational e-learning programs based on the data captured by a quantitative instrument such as the proposed e-LEI scorecard.

#### Limitations and Assumptions

The following two assumptions informed this study:

1. Stakeholder perceptions of what key performance criteria should be used in an e-learning program evaluation will be considered valid according to Trochim's Concept Mapping (1989) research on evaluating programs.
2. KPCs used in developing the e-LEI scorecard that came from the concept-mapping evaluation research can represent measurable benchmarks that may contribute to a better understanding of the effectiveness of a well designed and executed e-learning program.

This study has potential limitations. One is that it focuses on an e-learning program within one department of a single large retail organization. Thus, any conclusion drawn from the study does not generalize beyond this department or organization. On the other hand, the potential conclusions from this research may be able to be extended to other large organizations who have existing e-learning programs within their corporate education departments and who have similar hierarchy, culture, and business strategy.

## CHAPTER 2

### LITERATURE REVIEW

#### Measuring Organizational Performance

A new approach to strategic management in organizations was developed in the early 1990s by Kaplan and Norton. They named this system the “Balanced Scorecard.” Kaplan and Norton recognized some of the weaknesses and vagueness of previous management approaches, so the Balanced Scorecard approach provides a prescription as to what companies should measure in order to “balance” the entire organizational perspective.

The Balanced Scorecard is a *management system* (not only a measurement system) that enables organizations to clarify their vision and strategy and translate these into action. It provides feedback around both the internal business processes and external outcomes in order to continuously improve strategic performance and results. When fully deployed, the Balanced Scorecard transforms strategic planning from an academic exercise into the nerve center of an enterprise.

The Balanced Scorecard suggests that we view the organization from four perspectives, and to develop metrics, collect data, and analyze it relative to each of these perspectives: the Learning and Growth perspective, the Business Process perspective, the Customer perspective, and the Financial perspective, as shown in Figure 2.1.

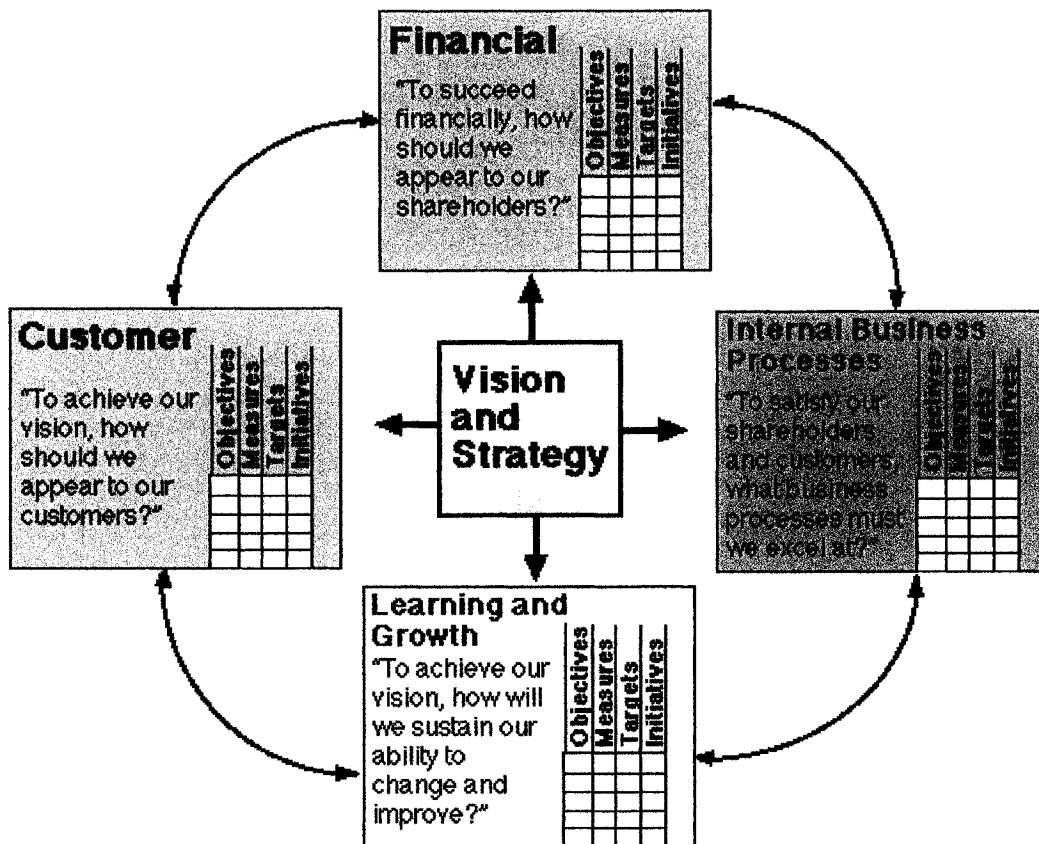


Figure 2.1 The Balanced Scorecard (Kaplan and Norton, 1993)

*The Balanced Scorecard and Measurement-Based Management*

The Balanced Scorecard methodology builds on some key concepts of previous management ideas such as Total Quality Management (TQM), including customer-defined quality, continuous improvement, employee empowerment, and primarily, measurement-based management and feedback. In traditional industrial activity, “quality control” and “zero defects” were the watchwords. In order to shield the customer from receiving poor quality products, aggressive efforts were focused on inspection and testing at the end of the production line. The problem with this approach—as pointed out by Deming (1994)—is that the true causes of defects could never be identified, and there

would always be inefficiencies due to the rejection of defects. What Deming saw was that variation is created at every step in a production process, and the causes of variation need to be identified and fixed. If this can be done, then there is a way to reduce the defects and improve product quality indefinitely. To establish such a process, Deming emphasized that all business processes should be part of a system with feedback loops. The feedback data should be examined by managers to determine the causes of variation and which processes have significant problems, and then they can focus attention on fixing that subset of processes. The Balanced Scorecard incorporates feedback around internal business process *outputs*, as in TQM, but also adds a feedback loop around the *outcomes* of business strategies. This creates a “double-loop feedback” process in the Balanced Scorecard. As Deming (1994) said, “You can’t improve what you can’t measure” (p. 12).

So metrics must be developed based on the priorities of the strategic plan, which provides the key business drivers and criteria for metrics that managers most desire to watch. Processes are then designed to collect information relevant to these metrics and to reduce it to numerical form for storage, display, and analysis. Decision-makers examine the outcomes of various measured processes and strategies, and track the results to guide the company and provide feedback. So the value of metrics is in their ability to provide a factual basis for defining the following:

- ◆ Strategic feedback to show the present status of the organization from many perspectives for decision-makers.
- ◆ Diagnostic feedback into various processes to guide improvements on a continuous basis.

- ◆ Trends in performance over time as the metrics are tracked.
- ◆ Feedback around the measurement methods themselves, and which metrics should be tracked.
- ◆ Quantitative inputs to forecasting methods and models for decision support systems.

### *Management by Fact and Measurement*

The goal of taking measurements is to permit managers to see their company more clearly from many perspectives and hence to make wiser long-term decisions (Baldrige, 1997). The Baldrige Criteria (1997) book reiterated this concept of fact-based management:

Modern businesses depend upon measurement and analysis of performance.

Measurements must derive from the company's strategy and provide critical data and information about key processes, outputs and results. Data and information needed for performance measurement and improvement are of many types, including: customer, product and service performance, operations, market, competitive comparisons, supplier, employee-related, and cost and financial.

Analysis entails using data to determine trends, projections, and cause and effect—that might not be evident without analysis. Data and analysis support a variety of company purposes, such as planning, reviewing company performance, improving operations, and comparing company performance with competitors' or with "best practices" benchmarks. (p. 206)

A major consideration in performance improvement involves the creation and use of performance measures or indicators. Performance measures or indicators are measurable characteristics of products, services, processes, and operations the company uses to track



and improve performance. The measures or indicators should be selected to best represent the factors that lead to improved customer, operational, and financial performance. A comprehensive set of measures or indicators tied to customer and/or company performance requirements represents a clear basis for aligning all activities with the company's goals. Through the analysis of data from the tracking processes, the measures or indicators themselves may be evaluated and changed to better support such goals (Baldrige, 1997, p. 103). Based upon the Baldrige Criteria, fact-based measurement is the cornerstone to any effective measurement system, and it supports Kaplan and Norton's (1993) approach to scorecarding any organizational system so that better decisions can be made by leadership to improve how the organization plans and operates.

#### *The Learning and Growth Perspective*

This perspective includes employee training and corporate cultural attitudes related to both individual and corporate self-improvement. In a knowledge-worker organization, *people*, the only repository of knowledge, are the main resource. In the current climate of rapid technological change, it is becoming necessary for knowledge workers to be in a continuous learning mode (Kaydos, 2003). Government agencies often find themselves unable to hire new technical workers and, at the same time, are showing a decline in the training of existing employees. This is a leading indicator of "talent loss" that must be reversed. Metrics can be put into place to guide managers in focusing training funds where they can help the most. In any case, learning and growth constitute the essential foundation for success of any knowledge-worker organization. Kaplan and Norton (1993) emphasized that "learning" is more than "training"; it also includes things

like mentors and tutors within the organization, as well as that ease of communication among workers that allows them to readily get help on a problem when it is needed. It also includes technological tools, what the Baldrige (1997) Criteria called “high performance work systems” (p. 89). Among these systems within an organization’s education and learning departments are e-learning systems that include electronic learning interventions such as communications, courses, electronic performance support systems, knowledge management, portals, and many other features.

### *Linking Learning and Growth to Business Strategy and Results*

Norton and Kaplan (1993) indicated in their Balanced Scorecard research that Learning and Growth is one of four cornerstones where an organization must provide objectives, measures, targets, and initiatives. In Fortune 2000 organizations today, the learning and growth element of professional development for employees falls under the umbrella of a corporate training and development department. This department traditionally has operated under the general guidance of the Human Resource organization or has been a self-standing business department reporting into other organizations such as Operations, Sales, Information Technology, or Accounting. Literature abounds today of the importance of aligning the training and development department’s strategy and mission with the goals of the business itself, as illustrated in Figure 2.2.

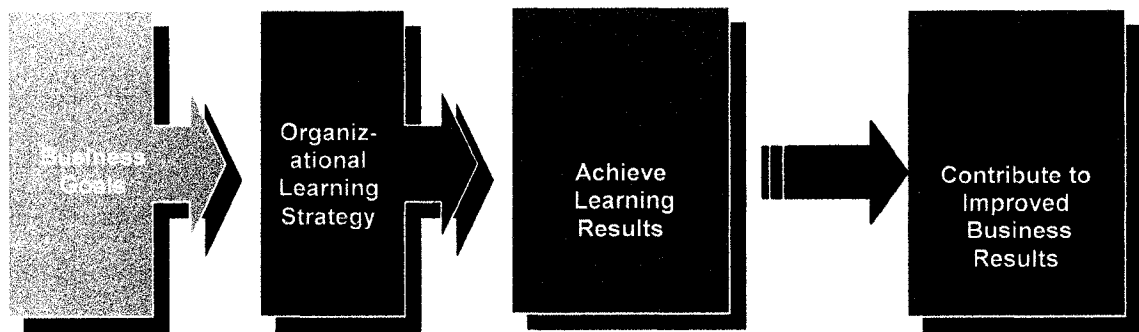


Figure 2.2 Relationship of Organizational Learning to Improved Business Results

Labowitz and Rosansky (2002) stated that linking the corporate learning strategy to business results is important because it optimizes investment in training and professional development, sustains a culture of continuous learning, anchors learning in daily operations, and improves the delivery of products and services to customers (p. 117). Within each organization, there are different stakeholders with varying interests in training and development needs that support business results. Different levels of management make different types of decisions, so it's appropriate that they use different measures in considering the benefits of a well-functioning training and development system (see Figure 2.3).

Function	Goal	Measurement	Scope
<b>Training manager</b>	Close skills gap	Individual performance	Business unit, specific training
<b>Business unit manager</b>	Achieve business goal	Project goals, business metrics	
<b>Corporate staff</b>	Choose the best alternative	Financial metrics, business case	Enterprise, e-learning infrastructure
<b>Executive management</b>	Gain competitive advantage, transformation	Business case, shareholder value	

Figure 2.3 Measures of a Well-Functioning Training and Development System

Although the benefits of organizational training are difficult to quantify, training analysts tend to agree on both the short- and long-term benefits of an effectively planned and executed training function within an organization. For the employee, potential benefits range from being able to perform current tasks well, acquiring new knowledge skills and attitudes to use on the job, increased motivation, and improved salaries and other incentives such as promotions (Buckley & Caple, 1990; Casio, 1994; Sibthorpe, 1994).

Organizational benefits from an effective training organization are derived from employees' learning new skills that improve employee performance, greater productivity, lower turnover, less time away from work, and improved client satisfaction (Buckley & Caple, 1990; Hale & Westgaard, 1995; Lynch & Black, 1996). If organizational learning is considered an important part of any organization's business success, then what are the Best Practice models for an effective training organization?

### *Models of Effective Training Organizations*

Various researchers, academics, and organizations themselves have combined some or all of the indicators of effective training organizations and their practices to build frameworks or models of an effective training organization. Among the most comprehensive are Brinkerhoff and Gill's (2003) Highly Effective Training model, the ISO's 9000 Standards (2006), Rothwell and Kazanas' (1994) Strategic Training model, and the International Board of Standards for Training, Performance, and Instruction model (Russo & Russo, 1996). Kunder (1998) performed a comprehensive analysis of existing models of effective training and development practices and developed an integrated model that incorporated all of the best practices into a single

model (Figure 2.4).

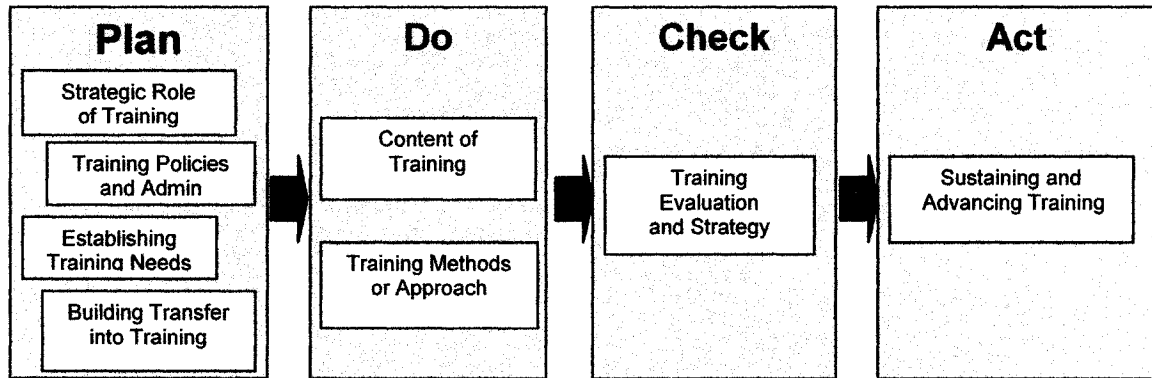


Figure 2.4 Effective Training Organization Framework: Best Practices (Kunder 1998)

As Figure 2.4 shows, this model is organized around a Plan, Do, Check, Act (PDCA) cycle, often known as a Stewart or Deming cycle (Senge, 1994). The exemplary organizations that have implemented and supported this model have several common characteristics that research experts in the training and development field agree upon that are critical to the success of an effective training organization. First, they Plan, by engaging in a significant amount of strategically oriented planning, prior to the introduction of training and development activities, by setting policy, determining training needs, and building transfer into the learning activities. Furthermore, effective training organizations then implement training activities (Do) and critically evaluate (Check) the success of training activities. The Act phase reflects the sustained effort to continuously improve and advance successful training activities (Kunder, 1998).

#### *Today's Organizational Learning Challenges*

Like the industries and markets that surround them, organizations and their competitors are required to adapt to change more quickly today than ever before. Change

is rapid, the knowledge objects are more complex, and increasingly, we have less time in which to learn. All of these factors have placed greater demands on learning, training, and professional development. As a result, organizations are looking for new answers to developing and delivering new knowledge; answers that are required if they are to gain and maintain a competitive edge. And it's not just a few companies who are feeling the demands for increased training. "We're big believers in the move to a knowledge-based economy," says Brant Sakakeeny, an investment analyst with Smith Barney, one of many investment firms to have issued bullish reports in 2005 on the education industry. "Corporate education is expected to be a large piece of that industry because knowledge workers will require more education and training than ever before, according to the prevailing thesis on Wall Street" (cited in Stamps, 1997, p. 11).

As more organizations restructure themselves with a global perspective, employee learning becomes even more of a competitive issue. The effectiveness of training efforts to promote organizational learning and knowledge sharing is a top concern. According to ASTD (2004), "Currently, in Canada and the United States, [companies] invest only 1% of payroll expenditures on training, while similar competitors in Europe commit 2.5% to 3%, and in Asia as much as 4% to 8%. We really are under-investing, largely because managers haven't seen the connection between training and results" (p. 34). The American Society for Training and Development study (2002) further asserted: "A solid relationship does exist between a company's performance and its workplace learning and development practices. Companies that use innovative training practices are likely to

report improved performance over time and better performance than their competitors” (p. 56).

*Shortcomings of Traditional Training within Organizations*

The statistics of organizational training’s success are hardly news. Research indicates that even in the best situations, adult learners leave remembering only about 20% of what was covered in the traditional classroom setting (Sugrue, 2001). And for many learners, it is too early for some and too late for others. Since instructor-led training should be geared to those with the lowest levels of knowledge within the classroom, it’s inherently imprecise in delivering what people need as well. Long-term retention can be improved with a well-prepared, highly effective trainer. In most scenarios, learners can absorb only between two or three hours of meaningful “content” in any single training day; and again, that rate drops as the number of consecutive training days increases (p. 128).

With the ever-increasing pace of business and change, quick and easy updates for training and knowledge information are critical. Within the traditional model of classroom instruction, an instructor can add new materials rather quickly, though he or she must still travel back out into the field (or employees must come to him or her) to deliver it. Other media, like video and sometimes print, are expensive to edit or add to and expensive again to distribute. The Delphi Group (2001), a firm that specializes in developing corporate learning organizations, recently completed a report on various training delivery systems. Table 2.1 summarizes the narrative results in the report.

Table 2.1 A Comparison of Attributes for Various Learning Media

<b>Training Media Performance</b>	<b>Classroom Instruction</b>	<b>Video-based</b>	<b>Audio-based</b>	<b>CD-ROM</b>	<b>Print-Based</b>	<b>Internet-Based</b>
Rapid course development and deployment:	Poor	Poor	Good	Fair	Good	Good
Effective testing and management:	Fair	Poor	Poor	Poor	Poor	Good
Easily enroll large numbers worldwide:	Poor	Poor	Good	Fair	Poor	Good
Collect and manage learner data:	Fair	Poor	Poor	Poor	Poor	Good
Rapid, direct feedback to learners and administrators:	Fair	Poor	Poor	Poor	Poor	Good
Share expertise, knowledge, problems, and solutions:	Good	Poor	Poor	Poor	Poor	Good
Focuses on the needs of each individual learner:	Fair	Poor	Poor	Fair	Fair	Good
Effectively transfers knowledge and skills:	Fair	Fair	Fair	Fair	Fair	Good
Available on demand, when and where needed:	Poor	Poor	Poor	Fair	Fair	Good
Minimizes time away from productive work:	Poor	Fair	Fair	Good	Good	Good
Easy to update and revise:	Poor	Poor	Poor	Poor	Fair	Good
Allows for self-pacing:	Poor	Good	Good	Good	Good	Good
Delivers a consistent Message:	Fair	Good	Good	Good	Good	Good



### *Developing Effective e-Learning Systems within Organizations*

The purpose of training is to improve business results through changed behaviors. Published industry reports indicate that classroom training just isn't as effective as it needs to be in changing behaviors for performance improvement. But has the search for new training methods been successful on the issue of effectiveness? Most organizational training leaders seem to think so. According to Lewis (1997), "Ford Motor, AT&T, Oracle, and Unisys are just some companies that have documented proof that e-learning is effective. Such organizations are using e-learning to enhance training, marketing, and communications" (p. 311). e-Learning for the purposes of this study is defined as "any learning or information that is disseminated to an organizational end-user by means of an electronic format (van Dam, 2004). See page 29 for a diagram of the many types and formats of e-learning systems and electronic performance support systems (EPSS).

In terms of effectiveness, when employees are involved in decisions that affect them and when they can take responsibility for their own actions, they are more motivated to act and follow through. That this notion of participation should apply to training is just common sense, and in support of this, Knowles, a noted adult learning expert, explained that people have a "deep psychological need to be self-directing" (1997, p. 76). According to Knowles, "By 2020, all learning—from elementary school through post-graduate education—will be based on the principles of self-directed learning. Classrooms will be used only for highly technical, didactic instruction. Most facilities will be workrooms where materials and other resources are produced for self-directed learning" (p. 78).

Most adult learners prefer to have the information they need, just when they need

it—no more, no less. Putting people in charge of where, when and what they learn is part of the answer to organizational training effectiveness. In many cases, this makes e-learning a very good solution. Xerox Management Institute has adopted learning programs, conducted mostly online, for senior and mid-level managers worldwide, often taking up to a year to complete. The Institute has said that “training at the employee’s place of business makes their learning more relevant and increases retention rates” (cited in Thornburg, 1998, p. 177).

Not every organization is using e-learning methods for delivering information and learning solutions. However, more often there are success stories about companies who are using the Internet or their internal intranets for delivery of training. According to Thornburg (1998), “The use of electronic learning technologies to deliver information and facilitate the development of skills and knowledge will revolutionize learning. Organizations that deliver training via the Internet or intranets will double their activity between 1997 and the first quarter of 2005” (p. 192). When it comes to e-learning learning effectiveness, the questions being commonly asked by performance designers and managers who fund the development are “Will they use it?” “Will it be there when they need it?” and “Will they apply it on the job?” In this light, e-learning might emerge as a very effective approach to learning in the future. Again, according to Thornburg, “the visual and auditory reinforcement of on-line programs reduces learning time by using a multi-sensory approach that maximizes the way individual employees retain information. In some instances, employees assimilate information so quickly that they can use newly acquired skills like experts while continuing to learn” (p. 198).

## Imagining the Perfect Learning Solution

There is no one learning solution that fits every learner's needs in the consumption of knowledge or in the building of new skills needed for effective performance on the job. Each learning solution presents its own challenges and demands, so the perfect learning solution may be a combination of systems and methods. In reviewing recent studies on training and learning programs and methods, and from recent industry reports of these new learning solutions, it appears that e-learning programs will take their place as a key learning solution within progressive organizations.

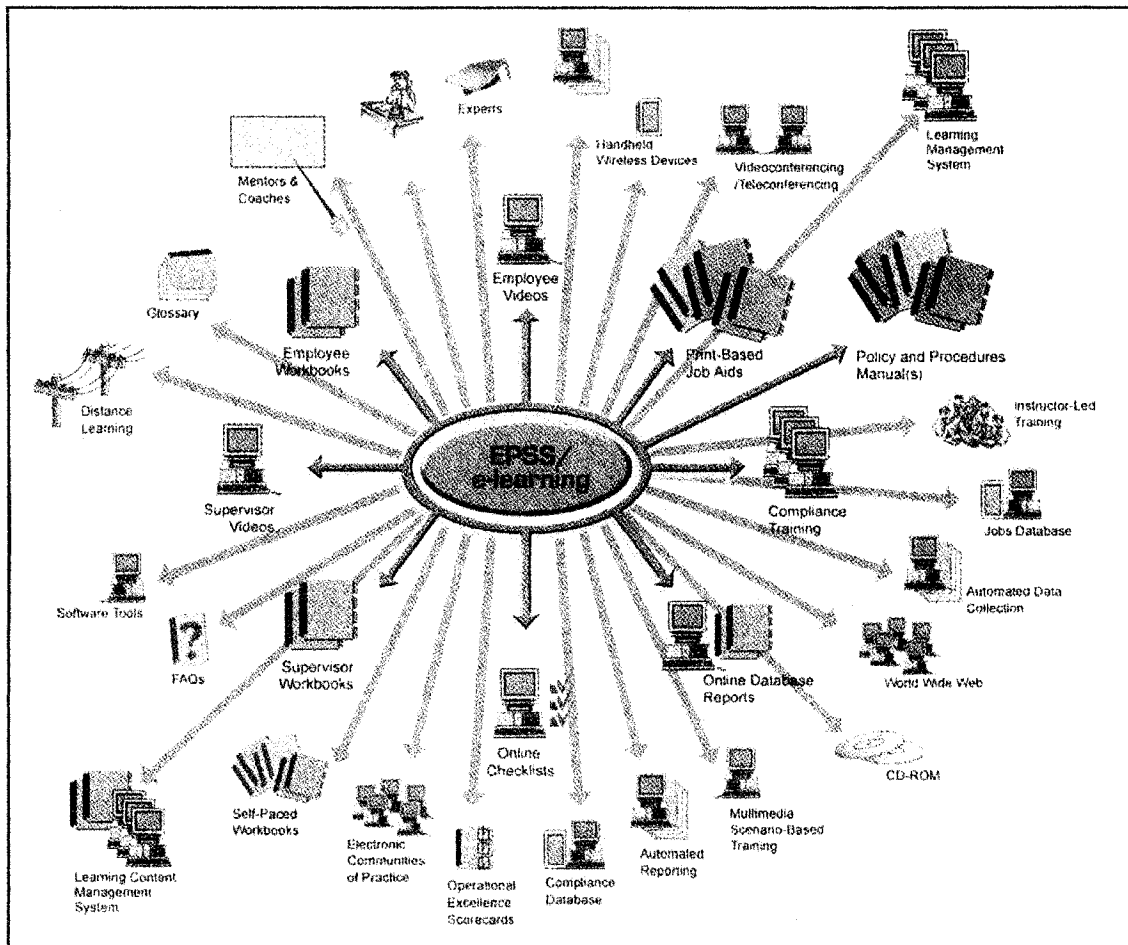


Figure 2.5 e-Learning's Long Reach into Employee Development (Sugrue, 2002)

Employees report that a chief complaint about training today is lack of time to attend learning sessions. However, organizations recognize that there should be a priority to retaining employees and to make them more productive by providing those employees with opportunities for personal development and training. Time pressures are one of the biggest reasons that organizations should take advantage of e-learning programs. “The speedy rate of training delivery is a clear advantage of most electronic learning technologies. Case studies show that self-paced, multimedia training can take 20 to 80 percent less time than instructor-led training, due to a tighter instructional design and learners’ option to bypass content already mastered” (Van Dam, 2003, p. 41).

A survey of more than 100 companies showed that multimedia training can reduce learning time by 50%, compared with classroom training (Bassi, 1997). Other estimates consistently concur with these time-savings. As Hammel (1997) noted:

According to data culled by Paycheck Training Systems (Morris Plains, NJ), real-world applications for interactive WBT learning sessions have proven to be effective for both students and training coaches. For such front-end skills as manufacturing safety guidelines, workers can learn the same material in half the time. And even if some time spent in the classroom is important, supervisors find they can trim their own teaching time by as much as two-thirds without compromising student progress. (p. 54)

These learning benefits aren’t reserved just for high-tech companies or computer experts. Well-designed learning modules and user interfaces can make e-learning solutions simple and direct, providing much more effective support than even a live

instructor. At CSX Transportation, Inc., a company with 30,000 employees, senior management asked the trainers to certify 11,000 employees in safety, environmental procedures, hazardous materials, and operating rules within 90 days. The company met that challenge with networked multimedia training delivered via a client/server system. “Even though the employees were not computer-literate, the company reported better understanding of the material, higher pass rates, and more employee satisfaction than with previous training methods” (Thornburg, 1998, p. 22).

Delivering training via intranets and/or the Internet makes reaching a geographically diverse workforce simple. Web-Based Training (WBT) is unmatched in its ability to provide updated information to many users in dispersed locations. Chevron Information Technology Co., the IT arm of Chevron, has used WBT for some its organizational training needs for several years. “You update one copy, and it’s quickly disseminated to the masses; it’s a very efficient and effective way of communicating to a large group of people. It’s reducing the window of time between when we deliver a product and when somebody can sign up for it” (cited in van Dam, 2003, p. 144).

There are other distinct delivery benefits that have great impact. With electronic delivery, an organization can easily enroll large numbers of users, worldwide. Testing, test results, and test feedback can all be managed quite easily and delivered immediately (Horowitz, 1997). This speeds learning and increases retention. But perhaps the greatest advantage of electronic delivery is its capacity to be multi-directional. Learners can be in immediate contact with administrators, subject matter experts, and peers using email and electronic news and discussion groups. This advantage is more controlled and sustained than even live training can offer.

Among the most obvious benefits to e-learning programs are those that have to do with its flexibility. End-users must have access to the information they need when they need it, and they can choose at their discretion to skip information that they already know or is not of immediate interest. Each learner can proceed at his or her own pace as well. Alternative training techniques are becoming more attractive because they allow infinite end-user discretion (Gibbons, 1997). Gibbons (1997) claimed that there is an increasing emphasis on delivering training to users when they want it—as opposed to when the organization deems it appropriate.

Some organizations see more benefits and more opportunities than others with e-learning programs. According to Kruse (2002), in the near future, it will be 80/20 in favor of computer-based learning methods. Instructor-led, paper-based delivery is too labor-intensive and it's not timely. Kruse saw organizations letting end-users serve themselves with the precise training they need, 24 hours a day, 7 days a week, by dialing in via modem from any location. Unless organizations get employees engaged in the online environment, they will never be able to get people up to speed in their skills. Things change too quickly.

In addition to its flexibility and effectiveness, there are distinct financial advantages that are inherent with e-learning solutions. The first place to look for savings is in development of the training material itself. e-Learning represents a breakthrough in lowering development costs. Although e-learning development has been shown to increase the initial outlay of capital for the performance designer in the development phase, its instructional delivery costs are typically negligible compared to instructor-led

interventions.

Perhaps the largest performance improvement in terms of cost savings offered by e-learning programs may be the reduction in time lost from productive work. Today, the cost of lost productivity due to workers being away from their jobs for training is nearly twice the cost of developing and delivering the training itself (Hammel, 1997). In this challenging environment, e-learning emerges as a breakthrough solution. Hammel (1997) also reported other significant savings derived from case studies in e-learning such as electronic performance support systems (EPSS). He found numerous examples, including the following:

- ◆ With help provided through online job aids for a new computer application, a large global airline company saved an estimated 23% of their training budget. In addition, 71% of users reduced their need to call the help desk and 78% were able to load the application using only the online job aids.
- ◆ A financial company found that using EPSS for new customer-service employees cut training time from 12 hours to 2 hours, reduced time per entry from 17 minutes to 4 minutes, and decreased the rate of errors from 20% to 2%.
- ◆ Using computer-based training, an international courier company estimated savings of over \$100,000,000 through reduced travel costs, training time, and errors.
- ◆ When a consulting company replaced traditional training with computer-based training, the cost per learner dropped from \$760 to \$106, and the same learning levels were achieved in about 50% of the time (Sugrue, 2002, p 34).

Raw savings aren't all that's being counted when it comes to the cost benefits of e-learning programs. "A study by the AMR Training and Consulting Group estimated a high return-on-investment from electronic learning technologies (particularly for Web-Based Training) ranging from 100-400 percent" (Kruse, 2002, p. 16).

Important news for some companies may extend beyond the bottom line to their actual worth in the marketplace. "The American Society for Training and Development now has preliminary evidence that companies that invest heavily in training are more successful and profitable. Such companies are also more highly valued on Wall Street, and their market value is growing. This information is based on a sample of 40 publicly traded firms in a broad range of industries" (Sugrue, 2002, p. 21).

#### *e-Learning Program Evaluation*

In the PDCA model of effective training organization framework, the third step in the model emphasizes Check, which includes the training evaluation strategy. This step represents a key activity that any training organization must perform to be effective as a corporate change driver through learning initiatives.

A succinct definition of e-learning evaluation is provided by Carnevale and Schulz (2001): "Evaluation of e-learning is the main method used to assess whether the program is accomplishing desired effects of sufficient value" (p. 182). Evaluation of discrete training events as a whole is an area that has been well researched and documented by Kirkpatrick (1996) and others (Cascio, 1989; Goldstein, 1993; Hawthorne, 1987). Throughout all research concerning evaluation or training program effectiveness, a common theme occurs: Training evaluation is an often neglected element in the effective



training organization framework. Van Dam (2003), while addressing the problems in the evaluation of e-learning, struck a sensitive nerve in the problem of evaluation:

...The evaluation of e-learning program effectiveness remains a pursuit fraught with intellectual, methodological, and practical problems. Lacking substantive conceptual formulations has hindered our ability to relate e-learning programs to actual performance or to translate actual performance into corporate benefits. Equally challenging is the need to quantify or otherwise portray outcomes in understandable terms relevant to decision makers own needs for the evaluation findings. (p. 33)

Furthermore, van Dam claimed that "...positive trainee reactions, learning, behavior change, and improvements in job-related outcomes are expected from well-designed and well-administered e-learning programs" (2003, p. 36). Yet evaluation of e-learning programs to determine if any of those consequences actually occur has been done perfunctorily and in ways that are not very useful.

#### *Why Evaluate e-Learning Program Effectiveness?*

Since e-learning programs are relatively new within organizations, skepticism, caution, and even hostility abound (Tanquist, 2000). These concerns may pervade organizational leaders, management, or the employee body. An evaluation that demonstrates the effectiveness and value of an e-learning program can help to quell concerns and fears. Reasons for evaluating e-learning programs are many and do not differ from measuring other learning activities (Tanquist). Tanquist (2000) provided many reasons why organizational e-learning program evaluation should occur. He believed it was important to give subject matter experts, performance designers, and

developers useful insights to improve the quality and effectiveness of future learning initiatives to satisfy learner curiosity or apprehension; to assist with strategy and decision-making; to supply organizational leaders and management with necessary information to justify current and future e-learning initiatives; and to demonstrate that e-learning is a viable training solution (p. 211).

Evaluation is most often about accountability (van Dam, 2003). e-Learning is often implemented with the two intentions: Increase the value of the organization's human capital and knowledge base and benefit from perceived efficiency, effectiveness, and related economic advantages. When an organization invests valuable resources on an e-learning program, executive management understandably wants assurances that as a result of its investment, employees will have learned what they were supposed to have learned and are performing at an improved level on their job. Individual improvements translate to improved business results (Tanquist, 2000; van Dam), which can ultimately produce a positive financial return. Recognizing that initiatives that either save money or make money receive funding, business leaders increasingly expect e-learning to demonstrate positive bottom-line results and return-on-investment.

#### *Why Program Evaluations Fail*

Tanquist (2000) researched several corporations to investigate their e-learning programs and their success and failures with those programs. He identified numerous reasons why these companies failed at effectively measuring their e-learning program's effectiveness. Notable among these reasons for program evaluation failure were the following (p. 83):

- ◆ Failing to clearly establish the purpose of the evaluation.

- ◆ Failing to establish research questions with a clear focus.
- ◆ Failing to identify how the evaluation results would be used.
- ◆ Failing to establish performance criteria to measure against.
- ◆ Attempting to measure too many variables.
- ◆ Attempting to scientifically “prove” that e-learning was responsible for a particular business result.
- ◆ Obtaining invalid research results.

As e-learning programs gain ground in organizations, these programs will become more complex as evidenced by the growth of knowledge management, and therefore they will become even more difficult to measure in terms of the program’s effectiveness. Improved approaches to measuring e-learning program effectiveness must be considered if training departments are going to be able to justify the existence and cost of e-learning programs.

#### *e-Learning Evaluation Approaches*

Numerous approaches to evaluating e-learning programs have been described in the literature. For instance, Hall (2002) discussed 10 primary criteria used in the judging of the Multimedia and Internet Training Awards (MITA) held semi-annually. They included (1) content, (2) instructional design, (3) interactivity, (4) navigation, (5) motivational components, (6) use of media, (7) evaluation, (8) aesthetics, (9) record-keeping, and (10) tone. The MITA criteria-labeled evaluation focuses on user/learner performance on a predetermined exercise intended to examine learning or mastery of a topics or series of topics. Earlier according to Hall (2002), evaluation evidence might

include end-user/learner completion of a simulation or quizzes, tests, and examinations intended to probe learner knowledge related to the training. As will become apparent shortly, many e-learning program evaluations focus almost exclusively on knowledge testing.

While the MITA criteria tend to emphasize the technical aspects of the instructional design web site, other evaluation approaches have taken a somewhat broader view by including considerations of both the technical and human infrastructure associated with e-learning. In addition to instructional and web-site design, McGreal (1997) included considerations of roles and responsibilities of several participant groups including instructors and tutors as well as learners. In connection with defining such roles, questions related to control of the development and deployment of e-learning instruction were posed. These asked respectively about the control of course development (e.g., individual, cooperative, open, teams, contracted out, specialists) and the control of the deployment (e.g., self-paced, tutorial, deadlines, scheduled labs, live class sessions). Other authors have emphasized additional dimensions of learner evaluation related to e-learning programs. In describing networked learning environments, Chute, Sayers, and Gardner (1997) stated that a course evaluation system should be designed to provide testing results quickly to learners. In addition, these authors emphasized the important role of support services designed to facilitate and assist learners in successfully completing a given instructional module. Beyond traditional individualized learner tests and quizzes, however, they also pointed out that collaboration on quizzes “can be a very positive learning activity” (p. 79). This is because when several learners collaborate, they are interacting in a manner that would not have taken place using a traditional

(individualized) quiz scenario. Through such collaboration, learners are exposed to other viewpoints on a subject, thus enhancing group-level learning. Several authors have discussed the evaluation of e-learning programs as a more general enterprise that includes a range of delivery technologies in addition to e-learning. In defining and applying program evaluation principles to the evaluation of e-learning, Simonson (1997) differentiated between theory-based research and evaluation, noting that evaluation (in contrast to research) is the “systematic investigation of the worth or merit of an object” (p. 88). In further drawing upon the 1994 Joint Committee on Standards for Educational Evaluation, Simonson noted that program evaluation is the systematic investigation of the worth of an ongoing or continuing e-learning activity.

Simonson (1997) also reviewed approaches to e-learning program evaluation based upon principles of program evaluation. Referencing the 1986 work of Woodley and Kirkwood, he outlined six categories of evaluation information that can be collected about e-learning programs. The first category includes measures of *activity*, which include counts of events, people, and objects (often available from administrative records). Typical counts might include the number of courses produced, the number of students enrolled, or the number of applicants for a particular program. The second category contains measures of *efficiency*. Such measures could include data pertaining to the number of students successfully completing the course, average student workloads, the number of students enrolled in related courses, and course costs and revenues (as tuition generated). The third category describes measures of *outcomes* related to student learning. In addition to test scores, student interviews and surveys can be used as well as more indirect measures, for example, the documentation of the use of courses and course

materials by other institutions. The fourth category includes measures of *program aims* that might examine data about the scope and demographic characteristics of learners reached by the program. The fifth category involves measures of *policy*. Policy evaluation often resembles market research focusing on surveys of prospective students and employers. But policy evaluation can also be used to determine the success of experimental programs as well. The sixth category includes measures of *organizations*. This involves monitoring e-learning program effects related to organizational efficiency. This can be accomplished through site visits and selective interviews with people in the organization (p. 91).

Recent empirical research has revealed that perceptions vary greatly among stakeholders as to what contributes to e-learning program effectiveness and organizational results. Michalski (1997) identified three role-based groups of stakeholders within organizations who are primarily involved in the design, delivery, and use of e-learning programs. They consist of the performance designer who designs and delivers the instruction, the end-user who benefits from the availability of the information and training, and finally the manager who pays for the e-learning program development and delivery to the end-user. Chute (1998) described managerial expected outcomes of e-learning effectiveness as associated with increased speed of doing work, flexibility, reduced overhead costs, increased employee productivity, and greater reach of learning. Schutte (1999) supported performance designers' claims that training effectiveness in an e-learning environment tested 20% better than students who learned through traditional methods in a classroom led by an instructor. Furthermore, Schutte reported that performance designers perceive e-learning program effectiveness to support improved

student evaluations of learning, faster learning time, better data collection techniques allowing improved analysis of instructional sequence, and improved ability to evaluate student comprehension and progress.

End-users appear to have different opinions about the usefulness of e-learning. Swan (1999) reported that end-users perceive e-learning programs to provide opportunities for enhancing skills for job improvement, keeping their skills competitive with those of others in the marketplace, improved learning flexibility, and reduced time away from the job for knowledge acquisition.

Brown (1994) found substantive differences in how managers and performance design specialists attribute causality for organizational results. Performance design specialists often identified training as either the sole cause or primary cause of the results that had been achieved within the organization. Managers rarely singled out training as a cause of improved results in their organization. Michalski, in a related study (1997), examined a large organization that delivered training primarily through traditional classroom based delivery. He found that from a traditional training perspective, training professionals attributed their involvement in key organizational results while managers considered client satisfaction and market awareness to be the most critical of a general training program's results. From a training evaluation perspective, this research is unique in that it focuses its research on managers within organizations who are traditionally the "paying" customers of training (Brinkerhoff, 1989), and training professionals, who are the providers of training. Most other models focus exclusively on the recipients of training.

The research makes it clear that e-learning evaluation involves a hybrid of organizational, human, and technological factors, which all combine to influence learning and ultimately performance. Yet most current models of e-learning evaluation in general and web-based learning in particular, tend to ignore, diminish, or overlook the complex interrelationships between these factors. In many cases, this oversight occurs because of the over-reliance on a few well-worn measures, especially knowledge testing and satisfaction surveys. Yet such an over-reliance can easily set the stage for the presence of untested or even unstated assumptions regarding the true benefit and role of e-learning in a given contextual setting.

Based on the literature reviewed and the findings of the case example described, Figure 2.6 depicts several elements of an emergent evaluative framework that can be used to make explicit the presence of, and relationships among the technological, human, and organizational factors affecting the evaluation of e-learning.



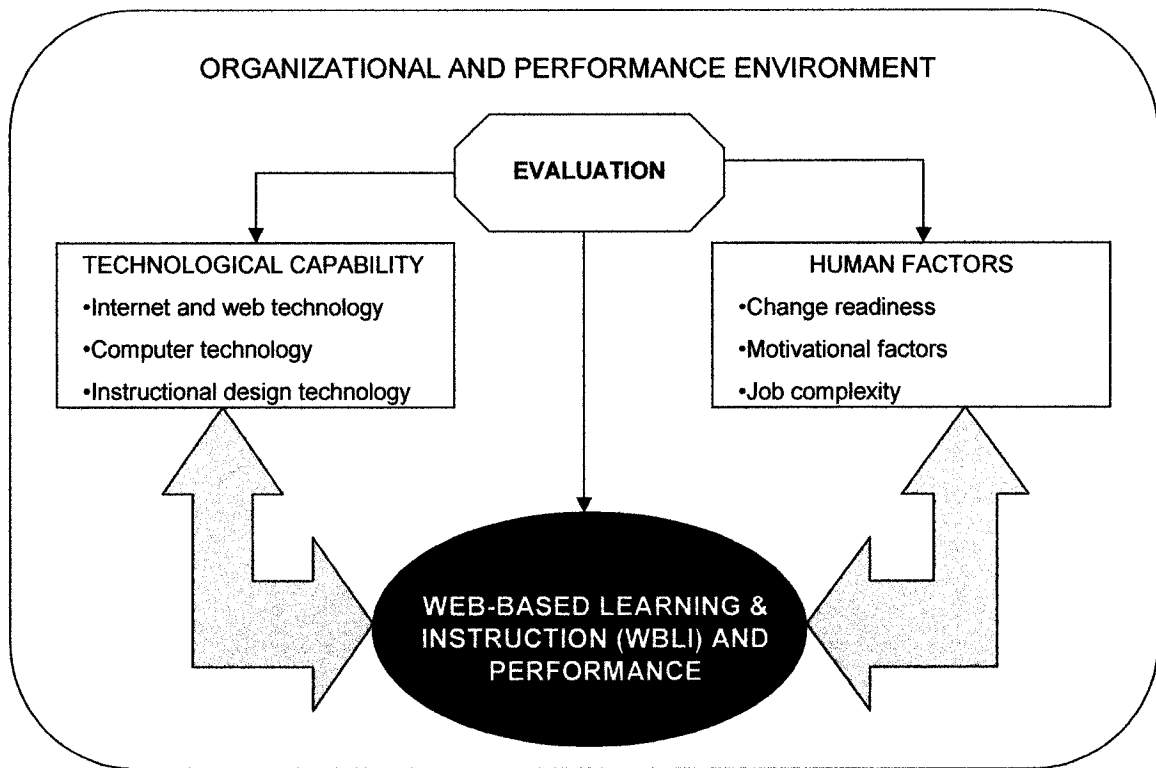
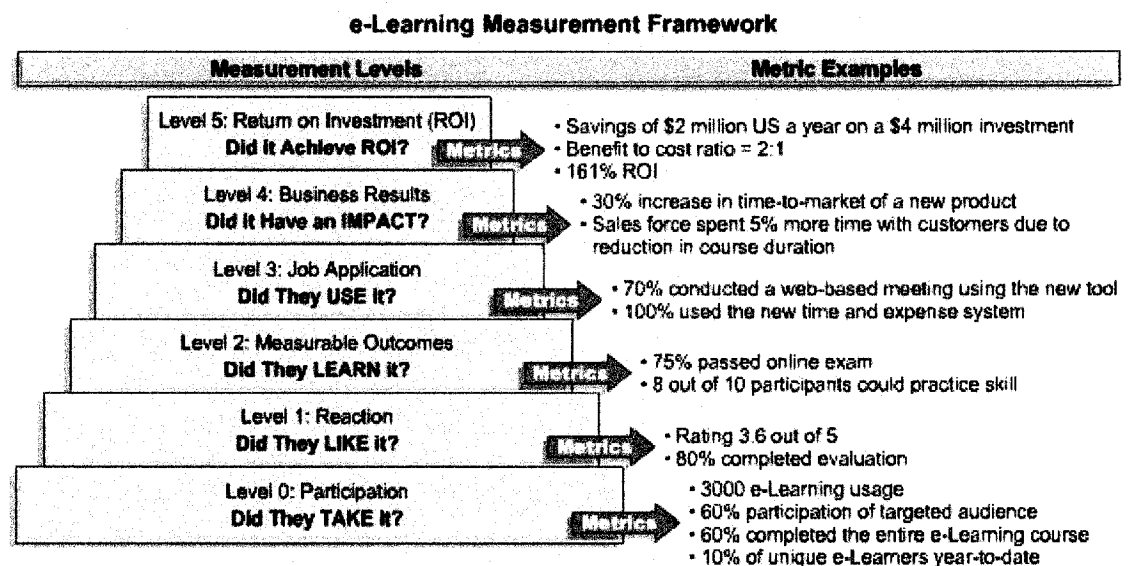


Figure 2.6 A Framework for Evaluating e-Learning Programs (Michalski, 2000)

Michalski (2000) developed this framework, which includes a balanced view of e-learning as it is influenced by the steadily emerging (Internet and other) technologies as well as the human and organizational context in which these are applied. Rather than make any given piece of instruction (web-based or otherwise) the central focus or unit of analysis, the framework casts evaluation in a more centralized position that examines the effects of an e-learning intervention within a specific contextual human/organizational and performance setting. Such a view places equal emphasis on several aspects affecting performance in addition to formalized planned learning.

Effectiveness of e-learning programs or events is most often evaluated using some combination of evaluation models. The most widely known and influential of these models among professional training practitioners was described by Kirkpatrick (1994) as

four levels of training results involving the learner: (1) reaction, (2) learning, (3) behavior, and (4) results in the organization. The level 4 of this model links training effectiveness with organizational effectiveness; it has driven numerous attempts by training evaluators to pursue “level-four” training results particularly as return-on-investment (ROI) in financial terms (Cook & Panza, 1987; Fitz-enz, 1988; Geber, 1995; Kearsley, 1982; Phillips, 2000). More recently a fifth level was added to Kirkpatrick’s model (Phillips, 2000) to evaluate a program’s effectiveness based on return-on-investment, which has made it more robust. And in 2003, van Dam suggested adding an additional level, called Level 0, which he coined, “participation,” referring to the learners if they actually took any e-learning intervention. Figure 2.7 provides a conceptual framework that integrates Kirkpatrick’s model with other thought leaders’ models.



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Figure 2.7 van Dam’s e-Learning Measurement Framework (2003)

In the 2006 *State of the Industry Report* produced by the American Society of Training and Development, 325 companies from nine regions around the world were

surveyed. As part of the overall study, the researcher investigated the use and application of organizations using evaluation methods in the year 2005. From the reporting organizations, here were the responses (p. 34):

- ◆ Level 1: 75% of the reporting organizations said they conducted Level 1 evaluations of training in 2006.
- ◆ Level 2: 41% of the reporting organizations said they conducted Level 2 evaluations of training in 2006.
- ◆ Level 3: 21% of the reporting organizations said they conducted Level 3 evaluations of training in 2006.
- ◆ Level 4: 11% of the reporting organizations said they conducted Level 4 evaluations of training in 2006.
- ◆ Level 5: 10% of the reporting organizations said they conducted Level 5 evaluations of training in 2006.

#### *e-Learning Evaluation Process*

Tanquist (2000) advocated that any organization planning to evaluate its e-learning programs follow a four-step process:

*Process 1: Establish Requirements.* The training department must utilize a process model such as Kirkpatrick's levels model. Involving multiple stakeholders in the organization, the evaluation team must work in a collaborative effort to clearly identify what they what to measure at each level in the model. In other words, they must develop specific performance criteria, what Tanquist (2000) termed "Success Criteria," against which they are going to measure the e-learning program's effectiveness. This approach is necessary

in that it creates reasonable evaluation expectations that meet organizational needs (Tanquist; Phillips, 2000).

*Process 2: Plan.* Management expectations must be understood before any evaluation activities begin. The following questions should be answered as part of the planning phase:

- ◆ What is the purpose of the evaluation?
- ◆ How will the evaluation benefit the organization?
- ◆ How will the evaluation be conducted?
- ◆ Who needs to be involved?
- ◆ How will we know if the evaluation process is successful?
- ◆ What resources will be needed?

*Process 3: Collect Data.* Once the evaluation project has been planned and the process and performance criteria measures are in place, then the training department must determine how they will collect the data. A clear and consistent methodology should be developed that guides the training department in their efforts to collect, record, compile, and analyze data from the evaluation. Policies, procedures, and guidelines in advance help to maintain consistency and useful documentation for future use (Tanquist, 2000).

*Process 4: Use the Results.* Phillips (2006) advocated that the e-learning program evaluation be viewed as process or quality improvement efforts. When program evaluations are completed, the training team involved in the evaluation should prepare a written report on the results of the e-learning program evaluation. Tanquist (2006) recommended that the report include the purpose of the evaluation, the questions the

evaluator sought to answer, a brief explanation of how the evaluation was conducted, analysis of the survey results, and recommendations. Finally, the report should be presented to executive management and then reported out to any and all interested stakeholders within the organization.

*An Expanded Model for the Evaluation of e-Learning Program Effectiveness*

The current research describes an expanded methodology and a supporting set of integrated procedures and processes that can be used to measure, analyze, and evaluate e-learning program results. This proposed methodology is based on the integration of existing models presented by scholars and expanded to fill voids that were left by incomplete evaluation methods. The overall methodology can be adapted and tailored to specific programs and environments. A case organization in this study is used to provide an example of, and to illustrate, how the tools, templates, and sub-processes involved can be integrated to form a customized view of e-learning program results.

Motives and reasons to evaluate e-learning program effectiveness abound, but they can be understood and broadly organized into at least two broad categories or evaluation perspectives. The first is known as *formative evaluation*, which is concerned primarily with program improvement. This broad category of evaluation makes certain assumptions about the basic merit and worth of the program being evaluated and then focuses mainly on matters of improving the program's ability to deliver these results. For example, it may be well established that an e-learning program effectively develops critical skills required by an organization such as improving customer service, accelerating product or service time to market, improving business processes, increasing sales, or improving leadership ability. Formative evaluation is then concerned with

measuring how the e-learning program can be improved to deliver these results even more effectively and efficiently. Formative evaluation questions include:

- ◆ How can the program be tailored to more effectively meet the needs of particular employee groups or even individuals?
- ◆ How can the time requirements for program completion be reduced to deliver the same results faster?
- ◆ How can program content be modified to deliver even better results for the same resource investments of schedule and cost?

Given that this formative evaluation is generally forward-looking and concerned with improving an e-learning program, it is assumed to be delivering its intended results and finding improved ways to continue to deliver these.

The second major evaluation perspective, and perhaps a more frequently embraced form of evaluation, is *summative evaluation*, which is concerned primarily with an examination of whether (and to some extent how) an e-learning program delivered its intended or expected results. As such, formative evaluation focuses on program outcomes or results answering questions such as:

- ◆ Did the program deliver the results expected in terms of, for example, reduced operating costs, increased quality, improved customer service, better employee relations, more effective use of technology, etc.?
- ◆ Did program participants effectively learn and transfer new knowledge and skills to the work environment?

- ◆ Did the overall benefits associated with the program exceed its overall costs, and if so, by how much?

Formative evaluation is generally understood to be that which is designed, done, and intended to support the process of improvement (development), while summative evaluation is the rest of evaluation intended to support conclusions for any reasons besides development.

A third program evaluation taxonomy is known as *developmental* evaluation. Patton (1997) focused on development-oriented programs that had as their purpose the vague, general notion of development in which the process is the outcome. Developmental evaluation eschews clear, specific, and measurable goals up-front because clarity, specificity, and measurability are limiting. The process often involves engaging participants in setting and achieving their own goals. Developmental evaluators never expect to arrive at a steady state of programming because they're constantly tinkering as participants, conditions, knowledge, and requirements change. Developmental evaluation represents an evolution of thinking about the purposes for evaluation and as such includes among its purposes areas such as developing programs and organizations, and creating learning organizations. This recognizes the complex nature of evaluation in organizations and corresponds well with the view of knowledge-based, intelligent, organizations.

A major advantage of the Aligned Scorecard approach described next is that it embraces and integrates multiple program evaluation taxonomies such as the formative, summative, and developmental forms. An aligned scorecard was developed using a combination of methods within a documented framework of established measures concerned with the nine sub-factors of quality, quantity, and cost that Gilbert (1996)

stated were necessary for measuring any performance activity. In addition to ensuring that stakeholder views about the most important outcomes and results of an e-learning program are identified and integrated into a set of Aligned Scorecard measures, substantial stakeholder involvement in the process yields the additional benefit of raising collective organizational knowledge about the true power and possibilities for e-learning in their organization.

Incorporating the strategic view of learning contributing to business results, it is proposed here that an expanded evaluation model be used within the overall framework of evaluating program results, specifically for e-learning initiatives. This model (see Figure 2.8) integrates three important processes within that framework:

1. Defining the KPCs that will be used to measure and benchmark the e-learning program's effectiveness.
2. Developing a performance measurement survey that will collect performance data against the previously defined KPCs.
3. Utilizing an e-LEI scorecard that will provide management with critical information on how well different stakeholders believe the e-learning program is measuring up against the defined KPCs.



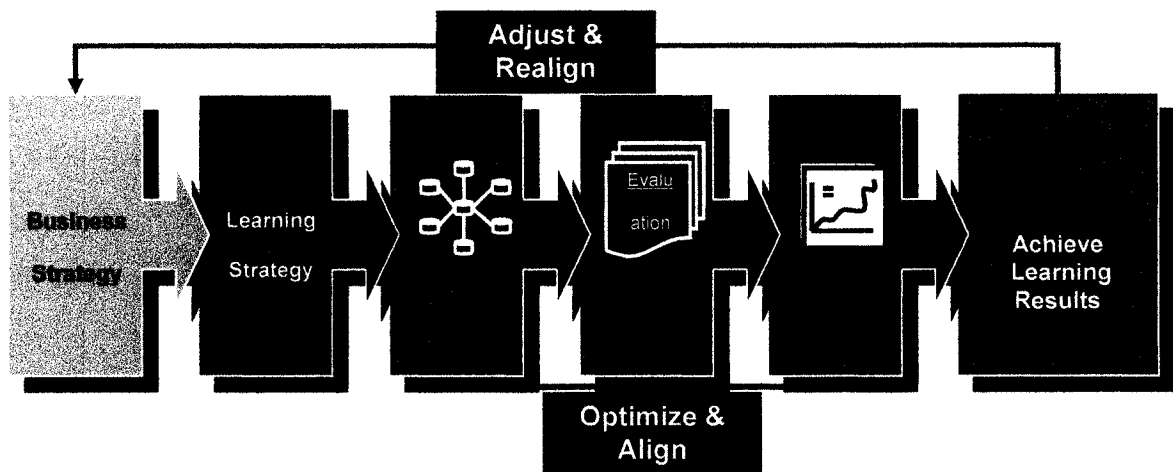


Figure 2.8: The e-Learning Effectiveness Index (e-LEI) Model (Petersen, 2007).

#### Defining Key Performance Criteria for Evaluating e-Learning Programs

If an organization were interested in evaluating the effectiveness of its e-learning programs, it might be expected to use some form of performance criteria requirements to measure against. Criteria here are defined as “the standard for judging things by an accepted standard used in making decisions or judgment or judgment about something” (Gilbert, 1996, p. 241).

Gilbert (1996) developed a framework for measuring workplace performance. He included three classes of criteria for performance measurement that he termed “requirements.” These three requirements are *quality*, *quantity* (or productivity), and *cost*. He stated that when measuring performance, any one of the requirements might be relevant, and a principal task in defining performance requirements is to be able to identify which requirement is relevant to the evaluation process. Within each of his performance requirements, Gilbert defined three sub-classes, which he called

“dimensions.” Table 2.2 summarizes each dimension within the three performance requirements as described by Gilbert.

Table 2.2 Gilbert’s Requirements for Performance Measurement

Metric Requirements	Countable Units (Example)
<b>Quality</b>	
Accuracy	Count of accurate transactions
	Count of inaccurate transactions
Class	Count of items in each category, rating, or class
Novelty	Count of useful variance along some dimension
<b>Quantity (or Productivity)</b>	
Rate	Count of any behavior or accomplishment per unit of time (minute, hour, day, week, etc.)
Timeliness	Count of timely events or items Count of untimely events or items
Volume	Count of items (as in “transactions”) OR Count of volume in units (as in dollar purchase per transaction)
<b>Cost</b>	

Labor (behavior repertoires)	Count of dollars spent on labor, by category
Material (environmental support)	Count of dollars spent on purchasing, by category
Management support	Count if dollars spent on management support, by Category

Gilbert (1996) argued that in order to measure the effectiveness of any performance, we must have requirements identified and then translate them into different units of measurement. There are no special requirements for choosing units of measurement, but it is necessary to establish the relevant requirements of an accomplishment and appropriate units of measurement before we can measure any standards of performance. Additionally, any identified accomplishment must fall within one of the nine requirements.

#### *Analysis of Stakeholder-Based Performance Requirements*

An analysis was performed based on existing research results on performance criteria that could be used in evaluating and measuring e-learning program effectiveness for multiple stakeholder groups. In order to develop a conceptual framework for evaluation purposes, Gilbert's performance criteria requirements were used as the foundation for building the model. Gilbert's model then could be populated for each organizational stakeholder with performance criteria supported by research results. This

would provide a benchmark for organizations to utilize in measuring their own e-learning program effectiveness based on different perspectives. McCaskey (1982) cited several sources of ambiguity in organizations, e.g., we are not sure what the problem is, we are not sure what we want, we are not sure who is supposed to do what, we are not sure how to get what we want, and we are not sure how to determine if we have succeeded. With accurate KPCs to measure from, the ambiguity can be clarified as the organization works towards a common vision with measurable goals and outcomes for their training programs (Shepko & Douglas, 1998).

Tables 2.3, 2.4, and 2.5 summarize from the literature multi-stakeholder perspectives of performance criteria that could be used to develop an evaluation tool for measuring e-learning program effectiveness.

Table 2.3 Performance Criteria from End-Users

Performance		
Criteria	Description of Criteria	Research Defining
Requirements	Requirements	Performance Criteria
<b>Quality</b>		
<b>Accuracy</b>	<b>The degree to which an accomplishment matches a model without errors of omission or commission</b>	<p>Increase accuracy of information</p> <p>Parfitt et al. (1993)</p> <p>Reduce interpretation and information errors</p> <p>Jones (1995), Dupont Engineering ("Facet,"</p>

1996), Teucholz & Fischer (1994)

Improves the re-use of information

Joosten (1995), Michalski (1997)

**Class** Comparative superiority of an accomplishment, beyond mere accuracy. Several kinds of units may be used to measure *class*:

- (i) Market value
- (ii) Judgment points
- (iii) Physical measures
- (iv) Opinion ratings

Increases employee satisfaction

Hammel (1997)

**Novelty** Usefulness of variance along some type of important dimension

Makes people productive as quickly as possible

Michalski (1997)

Dynamic adaptivity. Content changes constantly through user input, experiences, new practices, business rules, and heuristics  
Delphi Group (2001)

Has direct access of knowledge in whatever sequence makes sense to the situation at hand

Delphi Group (2001)

Learner pulls knowledge by determining

agenda

Delphi Group (2001)

Learning is self-directed

Knowles (1998)

**Quality**            When quality is clearly the product  
**Combinations**    of more than one quality requirement  
 $Q = f(a \times n)$

Capacity to be multi-directional. Ability to be immediate contact with administrators, subject matter experts and peers

Horowitz (1997)

Produces significant quality improvements

Michalski (1997)

## Productivity

**Rate**                Most common measure of  
                              productivity, and applies when  
                              "bulk" is time-sensitive

Improves efficiency

Elzaka & Bell (1995)

Parfitt et al. (1993)

Improves productivity

Elzaka & Bell (1995)

**Timeliness**        It applies when time, not bulk, is the  
                              key consideration

Reduces learning time

Bassi (1997)

Reduces time to market.

Michalski (1997)

Continuous. Learning runs in parallel and never stops

Delphi Group (2001)

Speedy rate of delivery

Hammel (1997)

<b>Volume</b>	This applies when bulk is important but is not time-sensitive
---------------	---

Produces higher productivity and fewer errors

Teucholz & Fischer (1994)

Delivery of knowledge in large quantities

Delphi Group (2001)

<b>Cost</b>	
<b>Labor</b>	The amount expended on purchasing all the necessary labor to make an accomplishment, including direct overhead, benefits, wages, insurance, and taxes

Less time away from productive work

Hammel (1997)

<b>Material</b>	All material costs required to make an accomplishment, including supplies, tools, space, energy
-----------------	---

Reduced time or complete elimination of

		travel
		Hammel (1997)
<b>Management</b>	<b>It supports internal allocations of general administrative costs associated with an accomplishment</b>	
		Increases management control
		Karake (1992), Michalski (1997)

Table 2.4 Performance Criteria from Managers

Performance		
Criteria	Description	Research Defining
Requirements	of Criteria Requirements	Performance Criteria
<b>Quality</b>		
<b>Accuracy</b>	<b>The degree to which an accomplishment matches a model without errors of omission or commission</b>	
		Increases accuracy of information
		Parfitt et al. (1993)
		Reduces errors
		Jones (1995), Michalski (1997), Teucholz & Fischer (1994)
		Improves the re-use of information
		Joosten (1995)
		Reduces or eliminates the need for changes



due to oversight and errors

Simms (1993), Teucholz & Fischer (1994)

**Class** Comparative superiority of an accomplishment, beyond mere accuracy. Several kinds of units may be used to measure *class*:

- (v) Market value
- (vi) Judgment points
- (vii) Physical measures
- (viii) Opinion ratings

Increases customer satisfaction at a greater rate

Joosten (1995), Michalski (1997)

Increases understanding of company and industry directions

Michalski (1997)

Increases competitiveness in the market

Miyatake & Kangari (1993)

Enhances management control

Teucholz & Fischer (1994)

Narrows the gap between how the end-user thinks and how customers think

Michalski (1993)

**Novelty** Usefulness of variance along some type of important dimension

Makes people productive as quickly as possible

Michalski (1997)

Influences end-users and improves the interaction among them

Elzarka & Bell (1995), Parfitt (1993), Teucholz & Fischer (1994)

More productive interactions between users and managers

Michalski (1997)

Creates company differentiator

Michalski (1997)

Improves ability to develop critical/core expertise

Michalski (1997)

Disseminates lessons learned knowledge

Michalski (1997)

Quality            When quality is clearly the product  
Combinations    of more than one quality requirement  
 $Q = f(a \times n)$

Improve the timeliness, consistency, and completeness of communications.

Teucholz & Fischer (1994)

Improves quality

Michalski (1997)

Improves the ability to integrate reviews and coordinate teams

Simms (1993)

**Productivity**

**Rate**            **Most common measure of productivity, and applies when “bulk” is time-sensitive**

Improves efficiency  
Elzaka & Bell (1995), Parfitt et al. (1993)  
Improves productivity  
Elzaka & Bell (1995)  
Generates information and reports more quickly from data  
Parfitt et al. (1993)

**Timeliness**

Reduces lead time and overall cycle time  
Karake (1992)  
Faster ramp-up time for new employees  
Michalski (1997)  
Reduces time to market  
Michalski (1997)  
Improves ability to rapidly implement change  
Delphi Group (2001)

**Volume**            **Applies when bulk is important but is not time-sensitive**

Produces higher field productivity and fewer field errors  
Teucholz & Fischer (1994)

Delivery of knowledge in large quantities

Delphi Group (2001)

Facilitates move from local optimization to global optimization

Miyatake & Kangari (1993)

**Cost**

**Labor**      The amount expended on purchasing all the necessary labor to make an accomplishment, including direct overhead, benefits, wages, insurance and taxes

Less time away from productive work

Elzaka & Bell (1995)

Better knowledge worker

Elzaka & Bell (1995)

**Material**      All material costs required to make an accomplishment, including supplies, tools, space, energy

Reduced cost for delivery of knowledge

Jelassi & Figon (1994), Kingman et al.

(1990), Simms (1993), Tapscott & Carson (1993)

Reduces classroom and storage space requirements

Ramamurthy & Premkumar (1995)

**Management**      It supports internal allocations of

general administrative costs associated with an accomplishment	
	Increases management control Karake (1992)
	Improves management's ability to retrieve accurate information on learners more quickly Karake (1992)
	Improves coordination and management Miyatake & Kangari (1993)

Table 2.5 Performance Criteria from Performance Designers

Performance		
Criteria	Description	Research Defining
Requirement	of Criteria Requirements	Performance Criteria
Quality		
Accuracy	The degree to which an accomplishment matches a model without errors of omission or commission	Increases accuracy of information Parfitt et al. (1993) Reduces errors Jones (1995), Michalski (1997), Teucholz & Fischer (1994) Improves the re-use of information

		Joosten (1995)
		Provides accurate information
		Michalski (1997)
<b>Class</b>	Comparative superiority of an accomplishment, beyond mere accuracy. Several kinds of units may be used to measure <i>class</i> :	
	(ix) Market value	
	(x) Judgment points	
	(xi) Physical measures	
	(xii) Opinion Ratings	
		Increases end-user satisfaction at a greater rate
		Joosten (1995), Michalski (1997)
		Increases understanding of company and industry directions
		Michalski (1997)
<b>Novelty</b>	Usefulness of variance along some type of important dimension	
		Makes people productive as quickly as possible
		Michalski (1997)
		Improves knowledge and proficiency required to perform on the job
		Michalski (1997)
		Increases organizational learning
		Michalski (1997)

		Supports customer's strategic and operational objectives Michalski (1997) Builds end-user capacity Delphi Group (1993)
<b>Quality</b>	When quality is clearly the product	
<b>Combinations</b>	of more than one quality requirement $Q = f(a \times n)$	
		Improves quality Michalski (1997)
<b>Productivity</b>		
<b>Rate</b>	Most common measure of productivity, and applies when "bulk" is time-sensitive	
		Improves efficiency Elzaka & Bell (1995), Parfitt et al. (1993) Improves productivity Elzaka & Bell (1995) Generates information more quickly from data Parfitt et al. (1993)
<b>Timeliness</b>	It applies when time, not bulk, is the key consideration	
		Just-in-time training needs are addressed Michalski (1997) Faster ramp-up time for new employees

Michalski (1997)

Improves ability to rapidly implement  
change

Delphi Group (2001)

**Volume** This applies when bulk is important  
but is not time-sensitive

Produces higher field productivity and fewer  
field errors

Teucholz & Fischer (1994)

Delivery of knowledge in large quantities

Delphi Group (2001)

Facilitates move from local optimization to  
global optimization

Miyatake & Kangari (1993)

**Cost**

**Labor** The amount expended on purchasing  
all the necessary labor to make an  
accomplishment, including direct  
overhead, benefits, wages, insurance  
and taxes

Less time away from productive work

Elzaka & Bell (1995)

**Material** All material costs required to make  
an accomplishment, including  
supplies, tools, space, energy

Reduced cost for delivery of knowledge



		Jelassi & Figon (1994), Kingman et al. (1990), Simms (1993), Tapscott & Carson (1993)
		Reduces classroom and storage space requirements
		Ramamurthy & Premkumar (1995)
<b>Management</b>	<b>It supports internal allocations of general administrative costs associated with an accomplishment</b>	
		Increases management control
		Karake (1992)
		Improves management's ability to retrieve accurate information on learners more quickly
		Karake (1992)
		Improves coordination and management
		Miyatake & Kangari (1993)

*Identifying Key Performance Criteria for e-Learning Program Evaluation through the Trochim Concept-Mapping Approach*

Concept mapping is a research methodology enabling a group to articulate ideas, assign objective meaning to those ideas, and represent the results in the form of a physical map (Kunkel, 1991; Trochim, 1989a). Trochim and Linton (1986) proposed a general framework for structured conceptualization, which they called concept mapping, and showed how specific conceptualization processes can be devised to assist groups in

the theory and concept formation stages of planning and evaluation. In using concept mapping, ideas are represented in the form of a picture or map. To construct the map, researchers first directly seek participants' perspectives on the ways in which they experience the phenomenon of interest through asking an open-ended question or conducting a phenomenological probe (Giorgi, 1985). These probes are designed to be sufficiently focused to elicit participants' perspective on the phenomenon, yet ambiguous enough not to unduly influence their response. Participants' written responses to the phenomenological probe are reduced qualitatively to a set of representative meaning units, which constitute items for further analysis. After the items are compiled into a rating form, participants indicate how well each item reflects their individual experience of the phenomenon; this provides information about endorsement patterns among individuals and subgroups of interest. Finally, participants perform unstructured card sorts with each performance criterion, putting them in groups as they perceive these constructs may be interrelated to one or another based on their own experience. The statistical technique of multidimensional scaling is performed on the card-sort data to suggest statistically and visually the organizational principles implicit in participants' sorting (Davidson, Richards, & Rounds, 1986). Cluster analysis is used to identify conceptually similar groups of sorted items (Borgen & Barnett, 1987). The content of the map is entirely determined by the group.

Concept mapping appears to be growing in popularity. It has been used to address substantive issues in the social services (Galvin, 1989), mental health (Cook, 1992), health care (Valentine, 1990), education (Kohler, 1993; Michalski, 1997; Trochim, 1993), educational administration (Gurowitz, 1988), and theory development (Linton, 1989).

Considerable methodological work on the concept-mapping process and its potential utility has also been accomplished (Bragg & Grayson, 1993; Cooksy, 1989; Davis, 1989; Marquart, 1989; Mercer, 1992; SenGupta, 1993; Trochim, 1993).

The process described is not the only way to accomplish concept mapping. For instance, Novak and Gowin (1984) suggested that concept maps be drawn “free-hand” after initial articulation of the major ideas and classification of them into hierarchical concepts. In a similar manner, Rico (1983) advocated “free-hand” concept mapping or drawing as a useful method for developing a conceptual framework for writing. Schmid and Telaro (1990) examined the usefulness of concept mapping in terms of its ability to individualize and raise the quality of learning in high school students. Furthermore, Hirumi and Bowers (1991) reported that the use of concept mapping significantly increased student attention, confidence, and satisfaction with instructional material.

These and other approaches have value for planning and evaluation, but they fall outside the scope of this investigation. The major differences with Trochim’s methodology and other concept-mapping processes just described are that Trochim’s method is particularly appropriate for group use as the method generates a group aggregate map, it utilizes multivariate data analyses to construct the maps, and it generates interval-level maps that have some advantages for evaluation especially through pattern matching.

Team concept mapping is consistent with the growing interest in the role of theory in planning and evaluation. Evaluation is seen as the process of ascertaining the decision areas of concern, selecting appropriate information, and collecting and analyzing information in order to report summary data useful to decision-makers in selecting among

alternatives (Alkin, 1991). Among the functions of evaluation, Stufflebeam and Webster (1988) included decision-making, accountability, and understanding as major aims. They emphasized that evaluation should assist decision-making and be geared toward supporting accountability. The suggestions made by these authors are closely aligned in stressing that evaluation has to be useful to those whom it intends to serve. This notion seems to correspond well with the potential interests of multi-role stakeholders (they want to make good decisions that provide a basis for improvement and accountability).

End-user-focused evaluation (Patton, 1988) is a sub-category of decision-oriented evaluation that emphasizes the instrumental client application of evaluation results, for example, in decision-making. Based on an interdisciplinary review of 65 studies of the use of evaluation results, Cousins and Leithwood (1993) developed a framework that considers evaluation utilization as “decision-making” versus “education.” This framework distinguishes evaluation implementation from decision or policy setting as respectively influenced by a separate set of six factors. The factors of evaluation quality, credibility, relevance, communication quality, findings, and timeliness are seen to influence implementation, while information needs, decision characteristics, political climate, competing information, personal characteristics, and commitment / responsiveness are seen to influence decision-making or policy-setting. Among other conditions, overall evaluation use was seen to be most evident when evaluation findings were consistent with user beliefs and expectations, if users were involved in the evaluation process, and whether users considered data relevant to their problems. In summarizing, the authors stated, “Results argue strongly for evaluation procedures that at

the outset generate information helpful to users in carrying out their decisions” (1993, p. 198).

The idea of involving multiple stakeholder groups in brainstorming to generate statements for the purpose of evaluation is not particularly new. In describing a multiple-constituency approach to assessing e-learning program effectiveness, Connolly, Conlon, and Deutsch (1980) treated effectiveness not as a single statement but as a set of several or many statements, each reflecting the evaluative criteria applied by the various constituencies involved. Building on this work, Altschuld and Zheng (1995) revisited Thompson’s (1967) Goal/Technology Contingency Table and the use of social reference groups for effectiveness assessment. They stated, “Lacking absolute criteria and causality related to outcome, complex organizations should turn to social referents to demonstrate their effectiveness” (p. 203). Essentially, the satisfaction of constituent groups or individuals is an indicator of learning effectiveness. The competing values framework argues that there cannot be a single, universally acceptable model of learning effectiveness. Concepts of effectiveness are value judgments based on the evaluator’s personal beliefs, interests, and experiences. In assessing effectiveness, evaluators must determine what a learning program’s processes, behaviors, and ultimate goals are, or should be.

Gilbert’s approach to developing performance criteria fills three gaps for evaluating e-learning program effectiveness within an organization: as a framework to improve performance designers’ ability to develop e-learning materials to meet the specific requirements of different stakeholders within the organization, as a framework for managers to improve decision-making accuracy and effectiveness with regards to e-

learning requirements, and as a way to create a benchmark for on-going role-based evaluation of organizational e-learning program effectiveness. As a performance measurement tool, it allows an organization to identify and improve on the performance criteria; identify possible alternative criteria requirements; and systematically assess, rank, and evaluate end-user learning results against the criteria to arrive at better decisions for improving e-learning programs and stakeholder performance.

The use of concept mapping as an evaluation process to support Gilbert's performance requirements approach might be useful in validating the performance criteria for three important stakeholder groups within an organization. The concept-mapping process provides accountability through ascertaining the decision areas of concern, selecting appropriate information, and collecting and analyzing information in order to report summary evaluation data useful to the organizational decision-makers.

Evaluation of e-learning programs can be improved through the introduction of key performance criteria following Gilbert's approach to measuring performance, as they are compared to and validated by multi-stakeholder perspectives through the use of concept mapping.

Several propositions were hypothesized in this research project. (1) Role-based stakeholders would have different perspectives on the key performance criteria that constitute effective e-learning programs. (2) A good multi-role based performance criteria model based on Gilbert's requirements and supported by existing research on e-learning program effectiveness could be designed. (3) A weighted ranking of key performance criteria necessary for e-learning could be usefully compared and contrasted, and the importance of the criteria would differ significantly between different groups of

organizational stakeholders. (4) The derived use of the key performance criteria could be used to create an e-LEI scorecard for ongoing measurement, monitoring, and reporting on the effectiveness of e-learning programs. (5)

The e-LEI scorecard could provide an opportunity for organizational decision-makers to evaluate their e-learning programs' effectiveness and results that would enhance their ability to measure the contribution of learning against improved business results.

## CHAPTER 3

### METHODOLOGY AND CASE ORGANIZATION

The research performed in this study consisted of the extensive empirical examination of a single-case (organization) study for the first two phases of the research; the final phase included the case organization and three other organizations. The data is arranged into three distinct phases, which progressively build on the results obtained in the previous phase.

This chapter contains descriptions of the study's three phases and the methods that were used to deploy and implement each as well as definitions and descriptions of the following phase-specific elements: purpose and goals, sample populations, implementation tools and instruments, and detailed phase deployment procedures. Description and discussion of the case organization that is the primary subject of this study, key stakeholders (sample populations) within it, as well as a definition of the context driving the research study are found early in this chapter. Figure 3.1 describes the integrated nature of the project.



Measuring e-Learning Program Effectiveness  
Using Mixed Methods in Three Phases

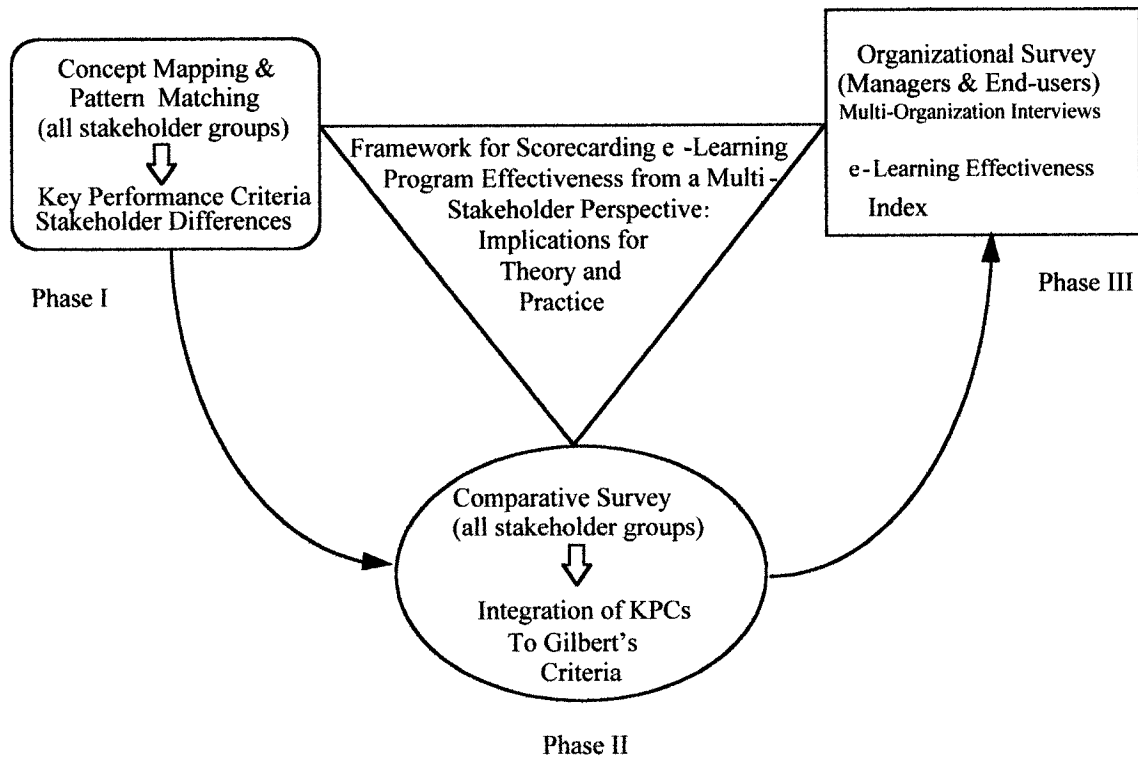


Figure 3.1 Methodological Integration of the Three Phases of the Study

Integration of the Phases of Study

Phase I of the research identified individual stakeholder group perceptions that determine key performance criteria (KPCs) used in the evaluation of e-learning program effectiveness with reference to the first and second research questions by using concept mapping and pattern matching. The concept-mapping process applied in the research encompassed both qualitative and quantitative methods. Pattern matching was used to develop empirical understanding of the perceptual variations across multiple stakeholder groups.

The purpose of Phase II was to confirm the results obtained in Phase I and further examine perceptual variations among the stakeholder groups regarding how well the KPCs corresponded with, and were organized and integrated into, Gilbert's (1996) model. This activity referenced the third research question.

The approach used in Phase II had the participants of the three stakeholder groups complete an electronic comparative survey. The results of this survey organized and ranked the KPCs into categories that fit into Gilbert's model of Performance Requirements. The outcome of Phase II provided the measurable key performance indicators (KPIs) as the input for Phase III in the development of the e-Learning Effectiveness Index (e-LEI) scorecard.

In Phase III, the research was further built upon by the results obtained in the two initial phases of the study. This final study phase involved the design and deployment of a Likert-style electronic questionnaire within the first case organization. This questionnaire was administered in survey form to the two key stakeholder groups in the case organization (managers and end-users). The quantitative analyses of the resulting data were used to further understand and quantify the effectiveness of the e-learning system within the case organization in the context of the overall study, and it provided reference to the third research question.

Figure 3.2 provides an overview of the methods, instruments, and tools, samples, procedures, and analyses that were used in the three phases of the study. Detailed descriptions and pertinent information regarding the context of the organization that was

the subject of this study are outlined on pages 77 to 79. Additional details for all of the study's phases are also provided later in this chapter.

#### Study Context: Case Organization

The investigation in this research study focuses primarily on one single case. A case study, such as this one, can be considered as both the process of learning about the case and the product of our learning. A case study is not a methodological choice but the choice of an object to be studied. Its central purpose is to optimize understanding of the case rather than generalize beyond it (Stake, 1995).

The organization that is the primary subject of this research is a division of a food products manufacturer, distributor, and retailer headquartered in Jacksonville, FL, with operations in 12 states. The primary organizational department within this company that was studied was the Information Technology Performance Technology (ITPT) department. This department designs, enhances, deploys, and supports corporate education and e-learning within the Information Technology (IT) systems department. This IT department supports the company's daily business and computer operations.

The department that participated in this study (referred to as the Information Technology Department—IT for the purposes of this research) shares corporate headquarters with several other corporate departments and employs approximately 550 associates. The corporation itself (as an entity) has 1200 stores, 16 manufacturing facilities, and approximately 120,000 employees nationwide.

Phase	Purpose	Instruments	Sample	Procedures	Analysis
I	<ul style="list-style-type: none"> <li>▪ Addresses research Questions 1 and 2 regarding key stakeholders' perceptions of KPCs used in measuring e-learning effectiveness (concept maps).</li> <li>▪ Quantified dimensions of perceptual divergence among stakeholders regarding the KPCs and their significance (pattern matches).</li> <li>▪ Partially addressed Question 3.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Structured brainstorming through concept mapping.</li> <li>▪ Rating of importance of concept mapping and pattern matching (see example in Appendix A).</li> <li>▪ Preliminary concept maps and cluster lists for stakeholder interpretation.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Approximately 40 stakeholders arranged in three groups, as follows: <ul style="list-style-type: none"> <li>▪ Program sponsors and Line managers (13)</li> <li>▪ Performance designers (training specialists) and training managers (13)</li> <li>▪ End-users of e-learning (14)</li> </ul> </li> </ul>	<ol style="list-style-type: none"> <li>1. Collected focus prompt statements.</li> <li>2. Edited for redundancy, clarity, and conciseness</li> <li>3. Input, sorted, and rated data into database.</li> <li>4. Prepared e-mails to forward individual sorting and rating forms that would be returned once completed.</li> <li>5. Upon receipt of the completed individual sorting and rating, constructed concept maps with respective stakeholder groups.</li> </ol>	<ul style="list-style-type: none"> <li>▪ Performed cluster analysis of multi-dimensional scaling.</li> <li>▪ Matched consensus pattern across groups.</li> <li>▪ Computed pattern match correlations for group perceptions of key performance indicators and importance ratings.</li> <li>▪ Computed bridging indices at item and cluster levels</li> <li>▪ Used Concept System software application.</li> </ul>

Phase	Purpose	Instruments	Sample	Procedures	Analysis
II	<ul style="list-style-type: none"> <li>▪ Clarified, interpreted, and confirmed Phase I results.</li> <li>▪ Addressed research Questions 2 and 3.</li> <li>▪ Matched KPCs into Gilbert's model and explored to what extent the views about KPCs, as perceived by each group, fit into Gilbert's model.</li> <li>▪ Informed Phase III quantitative survey.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Developed concept maps of the respective groups constructed in Phase I.</li> <li>▪ Surveyed ratings and placement of KPC statements into Gilbert's criteria for effective performance measurement.</li> </ul>	<p>10 program stakeholders randomly selected from the Phase I, sampled and arranged into three groups, as follows:</p> <ul style="list-style-type: none"> <li>▪ Program sponsors and line managers (3)</li> <li>▪ Performance designers (training specialists) and training managers (2)</li> <li>▪ End-users of e-learning (5)</li> </ul>	<ol style="list-style-type: none"> <li>1. Randomly selected from original stakeholder group sample.</li> <li>2. Sent electronic survey in software application to program stakeholders.</li> <li>3. Had participants rank KPCs against Gilbert's Performance Requirements model.</li> <li>4. Took total results from stakeholders' responses and used as input for Phase III.</li> </ol>	<ul style="list-style-type: none"> <li>▪ Survey development using the procedures described by Gilbert (1996).</li> <li>▪ Correlated and organized data for input into the survey that was designed in Phase 3.</li> <li>▪ Summarized the results by constructing conceptually clustered matrix displays.</li> </ul>

Phase	Purpose	Instruments	Sample	Procedures	Analysis
III	<ul style="list-style-type: none"> <li>▪ Addressed research Question 3.</li> <li>▪ Quantitatively validated and extended the knowledge acquired in Phases I and II by using two large stakeholder groups.</li> <li>▪ Interviewed 3 executive managers in 3 case organizations to determine usefulness of the aligned scorecard tool</li> </ul>	<ul style="list-style-type: none"> <li>▪ Electronic survey questionnaire for the aligned scorecard development.</li> <li>▪ Interview questionnaire with other secondary organizations</li> </ul>	<ul style="list-style-type: none"> <li>▪ n=30 e-Learning program users, consisting of managers and end-users for the scorecard input.</li> <li>▪ n=3 secondary case organizations</li> </ul>	<ul style="list-style-type: none"> <li>▪ Used input contributed during Phase II to create an electronic survey (e-LEI) using a software application.</li> <li>▪ Deployed e-LEI Survey on the Internet.</li> <li>▪ Collected response results from sample groups.</li> <li>▪ Calculated results and developed e-LEI for organizational review.</li> <li>▪ Performed organizational interviews. Correlated and synthesized data.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Descriptive statistics</li> <li>▪ Univariate analyses</li> </ul>

Figure 3.2 Overview and Summary of the Phases of the Study

The case organization consists of approximately 550 local, full-time technical and managerial employees. These employees are, for the most part, knowledge workers with professional occupational descriptions, made up largely of software programmers, analysts, application developers, and network engineers, as well as other highly skilled managerial, administrative, and technical support staff. As a department within a large corporation, these employees are offered a broad range of training and development interventions are offered, available from both internal and external training sources.

The Information Technology Performance Technology–ITPT (training and measurement) function has grown into a formalized program administered internally and funded annually through the Information Technology operations budget. The annual funding level for ITPT staff and training associated with the program ranges between \$750,000 and \$1,250,000 (US) annually. The program itself is bounded within the case organization (see Figure 3.3).

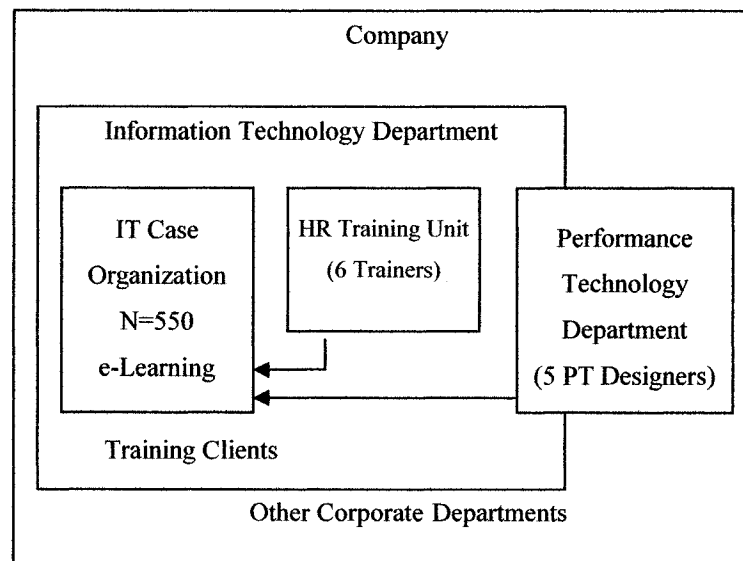


Figure 3.3 Position of the Primary Case Organization within the Company

This program consists primarily of policies, procedures, products, and services in the areas of training needs assessment, design/development, e-learning, knowledge management, instructional deployment, course-level evaluation, and administrative support. Specific instructional offerings include a limited range of learning interventions to support essential technical skills acquisition and competencies in the case organization. These are developed and deployed primarily through e-learning and instructor-led training. Many of the programs are organized into job-based “learning tracks.” Presently, there is no formal evaluation process in place to measure the effectiveness of their e-learning program, and for their education program as a whole. Course evaluation is carried out through informal reviews of individual end-of-course satisfaction surveys (Level 1, Kirkpatrick Model).

Training program decision-making is based primarily on input from IT managers and directors, based on an informal needs assessment performed annually in the case organization. The data and information used for ITPT training funding decisions generally involves quantitative measures associated with training participants’ (IT associates) use of the program, and training needs anticipated by management. In addition, subjective influences incorporate general impressions of training needs deemed by IT executives to be of significance as new technology is being deployed throughout the organization.

Three separate and distinct training stakeholder groups can be identified in connection with the education program within the Information Technology organization. These groups include training sponsors (directors and managers), IT associates (end-



users), and performance designers (trainers and developers). The population numbers of the three sample groups vary widely. Training end-users (IT associates) comprise the largest relative population at approximately 500 individuals. Managers in the case organization (program sponsors) number roughly 50. These individuals belong within all corporate levels (managers, senior managers, directors, and the CIO).

The ITPT department houses approximately 12 local performance technologists and training managers, all of whom are dedicated to the development and delivery of Information Technology and Human Resources training programs. This includes one training vice president, two managers, and six full-time performance technologists who report to the two managers. The two managers, in turn, report to the VP of Information Technology and Human Resources. Historically, the relationship between the ITPT and the case organization has been harmonious and effective. Within the company's corporate culture, this is a reflection of the good relationships, steady growth, and evolution of the ITPT group as a whole.

An e-learning program was initiated by the ITPT training team in 2003 to provide an electronic-based training program for all employees in the IT department. The program consisted of the deployment of a Learning Management System (LMS) that would track all training taken by IT employees, manage the delivery of courses, and provide competency models that support learning tracks for individual employees, manage tests and, ultimately, report to executive management. Courses on a variety of IT topics and management development were purchased from a vendor and loaded into the LMS for distribution to the IT employees. Subsequent to the online learning program, a

knowledge portal was developed by the ITPT team. The portal included information such as upcoming training events, management development articles, competency models for IT jobs, a communication system surrounding training, and other online training sites to visit.

### Concept Mapping and Pattern Matching

The use and discussion of concept mapping in evaluation practice has been growing steadily over the past 15 years (Rizzo-Michelin, 1997). Although several approaches to concept mapping have been developed, the approach detailed by Trochim (1989a; 1993) was used in this organizational case study based on its well documented use in evaluation and program planning (Cousins & MacDonald, 1995; Knox, 1995), training design and evaluation (Moad, 1995), and its suitability for comparing among groups, thus practicing pattern matching techniques. The preferred concept-mapping process is summarized sequentially in six stages. In *preparation*, the focus for the concept-mapping project is operationalized, selection of participants is agreed upon, and an implementation schedule is developed. In *brainstorming*, participants brainstorm in relation to a focus statement. In *structuring*, each participant individually sorts and rates the statements and rates the statements generated during brainstorming. During *map computation*, software is used to calculate the point and cluster maps. In *group interpretation*, the participants interpret the default map generated from the calculations. And in *utilization*, the resulting data is applied and used for research or problem-solving. What follows is a description of the implementation of this process in the context of the subject research study.

This research addresses the three research questions, which concern the identification and importance of key performance criteria (KPCs). Once identified, the KPCs were used in the evaluation of the overall e-learning program effectiveness and in the development of an e-Learning Effectiveness Index (e-LEI) scorecard. Concept mapping identified stakeholder perceptions of the KPCs using input from all three stakeholder groups. Pattern matching was used to compare and quantify both variations among the stakeholder groups in terms of their perceptions regarding the significance of KPCs in the evaluation of e-learning effectiveness.

The study's sample population consisted of 39 IT associates arranged into three groups of 13 participants each. The typically recommended total project sample size for concept mapping is 15 participants (Trochim, 1993). In an analysis of 38 concept-mapping studies, Trochim found the mean number of participants (i.e., statement raters and sorters) to be between 13 and 14. A total of 13 training providers (developers and managers) from the organization's Information Technology and Human Resources training departments were randomly selected and invited to participate. In the same fashion, 13 randomly selected training sponsors (directors and managers in the case organization) were invited to participate. Also, a total of 14 e-learning end-users (IT associates, non-managerial) were randomly selected and invited to participate. Due to the use of random selection, the respondents in each group were deemed to be demographically representative of their respective groups since there is no evidence or reason to believe that any participants differed substantially from non-participants in any significant way.

## Instruments and Procedures

### *Phase I: Concept Mapping and Pattern Matching*

Concept mapping and pattern matching are an extremely powerful methodology for identifying and analyzing KPCs that are particularly meaningful to stakeholders in evaluating a program's effectiveness. The concept-mapping and pattern-matching methods used in this research involved the use of specialized software optimized to capture, analyze, and present stakeholder ideas about the most important program results. Although a complete discussion of the details and foundations of concept mapping and pattern matching is well beyond the scope of this research, an overview is provided in Appendix A. The concept-mapping and pattern-matching steps used to derive the scorecard performance criteria consisted of three primary processes: preparing communications, collecting and analyzing data, and presenting and summarizing results. The processes and supporting procedures for each phase of concept mapping are described in detail in the next sections.

#### *Process 1: Preparing Communications for Stakeholder Participants.*

Communication strategy is a key to the success of concept mapping. Since different associates were involved at different times and for different reasons (as outlined above), defining and coordinating the various forms of communication to prepare those who participated in the concept-mapping phase were crucial. The communications strategy serves to pull together the details for moving forward with the concept mapping by confirming who will participate and by outlining the requirements for their

participation. Preparing the communications for the concept-mapping phase involved the following procedural steps.

*Procedure 1: Initiation e-mail message.* The purpose of this procedure was to obtain feedback from potential stakeholders who might participate based on their level of interest in contributing to this research project. To ensure that the study obtained 13 participants per stakeholder group, the address list for this message included more than this number from a random sample, with some recipients declining to participate. The actual message briefly outlined the individual's value to the project and described the requirements for their participation. The Initiation e-Mail appears in Appendix B.

*Procedure 2: Formal invitation letter.* Those who accepted the invitation to participate received a formal letter thanking them for their interest in participating in the research project. This invitation letter detailed the specific study activities and their involvement in the concept-mapping phase. This letter contained details about the overall concept-mapping process, including an invitation to an overview presentation and brainstorming activity, a description of the homework that would be required, and details regarding a second meeting where the concept map interpretation took place. The Formal Initiation Letter is contained in Appendix B.

*Procedure 3: Letter of informed consent.* Those who participated in the study provided their consent to supply the study with their ideas and insights towards developing the Balanced Scorecard metrics. Once the possibility existed that these ideas included varying degrees of proprietary information, each participant was asked to formalize his or her consent to participate via a formal letter that outlined the intended use of the

information they would be contributing to the research study. See Appendix C for a copy of the Letter of Informed Consent.

*Process 2: Concept-Mapping with Stakeholders*

Several procedures outlined in this process were repeated for each of the three stakeholder groups. A project overview presentation was performed three times—once for each group.

*Procedure 1: Overview Presentation.* A slide presentation was used to provide orientation for each stakeholder group before beginning the concept-mapping and pattern-matching evaluation activity. The objective of this presentation was to provide an overview for participants about the nature and process of concept mapping and to “walk” participants through the methodology to ensure that they knew what to expect. The main sections of the presentation included a project overview, an introduction to concept mapping, e-learning definitions, and a brainstorming activity. A complete Microsoft PowerPoint™ presentation was developed to accomplish this procedural step. After all participants were oriented to the process of concept mapping, the concept-mapping brainstorming sessions for each stakeholder group were held in the same office building.

*Procedure 2: Brainstorming Focus Statement Formulation.* The preliminary concept-mapping activity required each participant in each stakeholder group to generate statements in response to a “focus instruction” regarding KPCs for evaluating e-learning program effectiveness within the organization. The preliminary statement generation was done individually by each stakeholder group through the brainstorming procedure in concept mapping. All stakeholder groups were involved in the live brainstorming

sessions facilitated by the researcher. The preliminary concept mapping “focus statement” was a concise instruction directed to the group: *Generate statements (short phrases or sentences) that describe specific performance criteria that can be used to evaluate the effectiveness of the e-learning program for Winn-Dixie Stores.* A “focus prompt” was used by participants as a check while generating statements to stay on task. For this focus statement, each brainstormed statement was to make sense when preceded by the following focus prompt: *A specific performance criteria that can be used to evaluate the effectiveness of the e-learning program for Winn-Dixie Stores is \_\_\_\_\_.*

*Procedure 3: Stakeholder Brainstorming Sessions.* This brainstorming procedure was repeated for each of the three stakeholder groups. The main goal of brainstorming was to assemble each group, facilitate an exhaustive brainstorming session using the focus statement previously defined, and obtain a list of performance criteria statements from each group. The following brainstorming definitions and guidelines were used and communicated verbally to all participants before the session began:

- Brainstorming is a process for creating a broad list of ideas in response to an initial question or idea.
- Brainstorming is a method of shared problem-solving in which all members of a group spontaneously contribute ideas.
- The emphasis is on broad and creative thinking inviting all participants’ points of view.
- All relevant aspects of an issue or question are considered.

- All ideas—however simple or creative—are welcomed and encouraged.
- No one should comment on an idea during the brainstorm (to include no censorship). Let the ideas flow freely!

After all brainstorm statements were captured from each stakeholder group, they were combined into a master statement list. Statements from this master list were then refined into a final set of statements by the three focus groups. The Brainstorming Template and Brainstorming Worksheet contained in Appendix B were used by participants to capture their own brainstorming statements related to the focus statement.

*Procedure 4: Refining Brainstormed Statements.* The process of brainstorming is by definition a free-flowing, open process that places a higher value on surfacing the thinking of the group. As such, redundant and repeated statements will tend to emerge and become part of the initial set of raw brainstormed statements. For this reason, it was necessary to perform a comprehensive edit of all captured performance criteria statements by the three stakeholder groups. An editing process was performed by all participants, involving the combination or removal of obvious redundancies, clarification of terminology (acronyms, abbreviations, etc.), as well as checks for spelling and grammar. This edit was facilitated by the researcher using the following set of guidelines:

- Retain Statement meets focus prompt, and is unique, clear, and understandable—leave the statement as it is.



- **Edit** Statement is unclear and requires re-wording or should be combined with similar other statements.
- **Augment** Statement is incomplete and needs additional detail for clarification.
- **Delete** Statement is redundant or not understandable and should be eliminated.

The purpose of the editing phase was to retain a clear and minimal set of distinctive statements that fit the focus prompt and could be effectively sorted and rated during the homework phase. The raw response statements were stored in a database file on the researcher's laptop and used for editing by the researcher. A final set of 91 statements was derived and used for the subsequent concept- mapping tasks. The proportionality of the original set of raw statements was preserved so that approximately one-third of the 100 statements came from each of the three groups (as in the raw set). The final list of statements was then presented to each brainstorming participant as a homework activity at his or her desk for the purpose of sorting the key performance criteria and importance rating.

*Procedure 5: Final Performance Criteria Statement List.* Editing the set of all stakeholder statements produced a final set of statements that were used for sorting and rating. The raw set of brainstormed performance criteria statements obtained from the stakeholder groups is shown in Figure 3.4, which illustrates the set of unedited statements from the stakeholder groups.

1. Percentage of skills transferred to the job
2. Increased use of e-Learning
3. Usability of new knowledge on the job
4. Improved test scores
5. Number of courses completed (required and optional)
6. Number of course registrations
7. Improved level of learner satisfaction
8. Improved job performance
9. Aids or assists growth and career development
10. Degree of management support
11. Improved associate satisfaction and morale
12. Improved customer service
13. Reduced learning time
14. Number of hits to online course catalog
15. Ease of course availability
16. Ease of course accessibility
17. Ease of course navigation
18. Number of requests for additional courses
19. Accommodation of multiple learning styles
20. Low course abandonment rate
21. Improved work group effectiveness
22. Positive informal feedback (word-of-mouth)
23. Ability to access training outside of work
24. Level of associate participation after-hours
25. Increased rate of internal promotion
26. Courses are short in duration
27. Improves talent recruitment and retention
28. Courses keep learner's attention
29. Promotes continuous learning
30. Improves associate performance
31. Improves profitability
32. Increased sales
33. Improves company pride and brand name
34. Pre-/Post-course performance improvement
35. Presence of measurable learning objectives
36. Course availability for all levels of learners
37. Promotes associate empowerment
38. Percentage of course evaluations completed
39. Learner suggestions are actively solicited and acted upon for course improvement
40. Reduces associate percentage with below-average performance
41. e-Learning is perceived as an associate benefit
42. Improved associate reading skills
43. Rate of voluntary course participation
44. Improved computer usage and skills
45. Improved ability to unlearn and relearn
46. Reduces information overload
47. Reduced training travel time
48. Reduced training travel cost
49. Fosters an environment in which management encourages associates to train at work
50. Rewards and incentives for successful course completion
51. Reduced course material cost
52. Provides "just-in-time" learning
53. Teaches WD programming standards
54. Number of associate certifications

55. Improves WD's core competencies
56. Level of interactivity and feedback
57. Access to published literature
58. Delivers best practices and new technology
59. Teaches WD-specific methods
60. Provides summary recap, "walk-aways," job aids
61. Modularized courses build upon each other
62. e-Learner records easily available
63. Accredited courses (e.g., college credits, CEUs, degree program, advanced degree program)
64. Improves coursework planning with management
65. Learning is integrated with performance reviews process
66. Availability and quality of electronic reference library
67. Provides opportunities for immediate skill demonstration
68. Increases organizational intelligence (Are we smarter?)
69. Improves organizational performance
70. Enables supervisory observance of learner progress
71. Improves speed of acquiring new knowledge and skill
72. Fosters a learning environment
73. Accommodates remedial training
74. Supports strategic direction of business
75. Improves company reputation for recruiting
76. Breadth of course subjects available (e.g., technology, business, leadership, etc.)
77. for review and self-management
78. Presence of detailed syllabus and prerequisites for all courses
79. Learning tracks are clearly defined
80. Increased associate collaboration
81. Relevance to current or planned projects
82. Learning is fun!
83. New hire (new associate) course availability
84. Improved scorecards in various areas
85. Availability of training 24-7, year-round
86. Course content currency (courses up-to-date)
87. Delivery system performance and reliability
88. Supports and complements mentoring
89. Improves ability to meet project milestones
90. Improved learning efficiency
91. Reduces complexity of our systems
92. Improves communications

Figure 3.4 Raw e-Learning Performance Criteria Statements

*Process 3: Sorting and Rating of Statements*

The final set of brainstormed statements was individually sorted for similarity and rated according to importance. This process was completed as a homework assignment by each participant using the *Concept System Remote Application* on his or her computer.

*Procedure 1: Distribute Concept Remote Application.* The Concept System Remote Application is an executable file that was distributed as an e-mail attachment to each participant, who then sorted and rated the set of brainstormed performance criteria statements. Each participant in the study was given a unique concept system username, and the software application then allowed each participant to complete his or her sorting and rating, and then save these results to a database file (.mdb). Each participant in the study then sent the completed database file back to the researcher, and it was entered into the Concept System software application.

*Procedure 2: Sorting and Rating Statements.* Using the Concept System Remote Application, each participant individually sorted and rated all performance criteria statements according to the set of guidelines listed below. The main point was for the individual participants to group the statements in a way that made sense to each of them according to the guidelines presented:

1. Group the statements by how similar their meanings are to each other. Do not group the statements according to how important they are, how high a priority they have, etc. Each statement will be rated for its importance as a separate activity.
2. There is no right or wrong way to group the statements. You will probably find that you could group the statements in several sensible ways. Pick the arrangement that feels best to you.
3. You cannot put one statement into two piles at the same time. Each statement must be placed into only one pile. People will differ as to how many piles they end up with. Typical sorting results might include anywhere from 8 to 20 separate statement piles.

4. A statement may be put alone as its own pile if you think it is completely unrelated to any other statements, or if it stands alone as a unique idea.
5. Make sure that every statement is put somewhere; do not leave any statements out!
6. Do not create any piles that are “miscellaneous” or “junk” piles. If you have statements left over that you can’t place, put each of those “remnant” statements in its own pile.

Each participant was also asked to rate the relative importance of each statement using a 5-point Likert rating scale (*unimportant, relatively unimportant, neither important nor unimportant, important, extremely important*). The *Concept System Homework and CS Remote Distribution* document contained in Appendix B was used to distribute the Concept System Remote Application to all participants. This software application was used to explain the installation of the application and how to use it to complete the sorting and rating homework.

*Procedure 3: Collecting the Sorting and Rating Homework.* The Concept Systems Remote Application allowed participants to complete the homework assignments on their own computers and to submit the results by e-mail to the researcher. At the conclusion of this data collection, the researcher used the Concept Systems Remote Application to quantify and rate the results. *The Homework Completion Tracking Template* contained in Appendix B was used to track the progress of the participants in their sorting and rating tasks.

*Procedure 4: Concept Map Generation and Map Interpretation.* A concept map was generated from the Concept System software based on the brainstorming, sorting, and

rating data provided by the research participants. All sorting and rating data were input from the remote modules returned by each participant. The Concept System software package took this data and then used it as input for the calculations it performed to generate the concept map in the study. When generating the concept map, the researcher interacted with the software to provide certain specific parameters for the map, for example, the initial number of clusters and tentative cluster names. A working map was then presented in a second meeting at the corporate office, and groups created the final “interpretation” of the map by making final decisions based on the parameters. Of the original group of participants who generated the performance criteria statements for e-learning effectiveness, a final sample group of 19 associates returned to a second meeting session to complete the sorting and rating assignment.

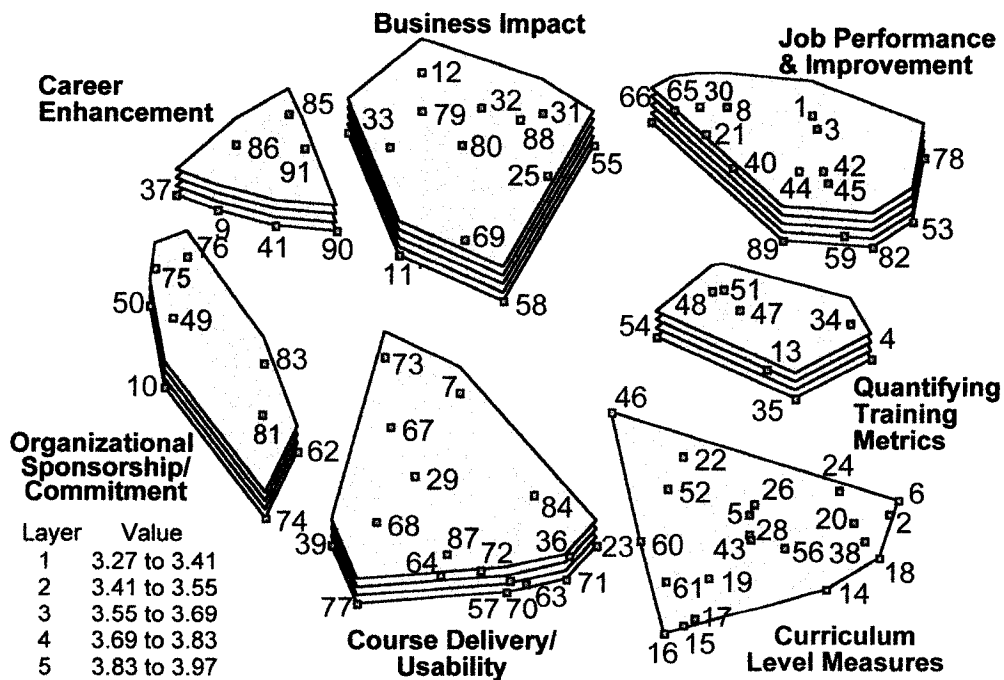


Figure 3.5 Combined Concept Map from Three Stakeholder Groups

*Procedure 5: Presenting Results to Stakeholders* Presentation of results was provided by the researcher, who detailed a description and explanation of how the final concept map would be produced. The final map developed by the software was presented and explained by the researcher, and then it was discussed by the participants (see Figure 3.5). During this procedure, key map features were highlighted. A selected set of pattern matches was created to determine how well different groups and individuals agreed /disagreed with each other on the performance criteria and as an overall group. For example, the sample pattern match shown in Figure 3.6 shows the comparison through pattern matching between directors and managers in the relative value they assigned to statements in each map cluster.

In the example illustrated in Figure 3.6, the relatively high correlation ( $r=.82$ ) indicates that there is good agreement between the groups on the importance of performance criteria in the evaluation of e-learning program effectiveness.

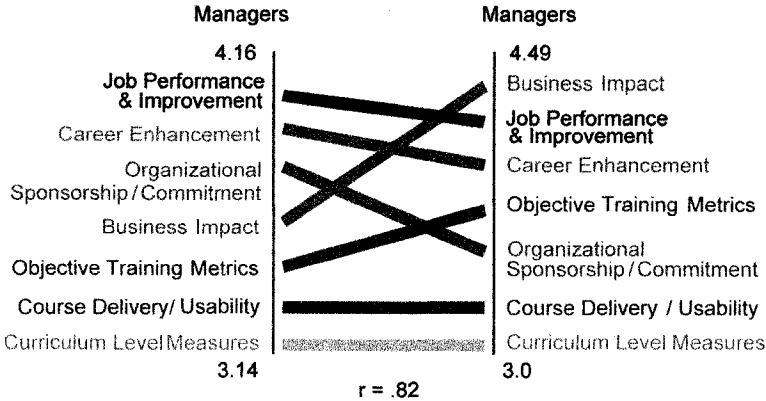


Figure 3.6 Example of a Possible Outcome of a Pattern Match

*Procedure 6: Concept Mapping Summary.* The e-learning KPCs were created and validated using concept mapping and pattern matching. This provided the foundation for

developing the Balanced Scorecard tool further by incorporating a performance measurement framework from the Human Performance Technology (HPT) literature as described by Gilbert (1996). Using this framework involves placing the performance criteria defined in the concept-mapping phase into Gilbert's model and then allowing stakeholders to rank the relevance of each dimension of the model to each performance criterion. This procedure was followed by using a survey instrument deployed as a spreadsheet in Phase II. Each participant was asked to evaluate each performance criterion in the concept-mapping procedure, then to place the criterion within one of Gilbert's categories. The outcome of this activity was to then categorize every performance criterion in Gilbert's model and in turn use them in the creation of the survey that end-users would complete as part of the final third phase.

### *Analysis*

This section describes concept mapping and its associated analytical procedures related to pattern matching and bridging calculations. All data from the concept-mapping procedure was analyzed as a single project using the Concept System version 2.01 (Concept Systems, Inc., 2002, Ithaca, NY). Both the main statistical procedures (multidimensional scaling and cluster analysis) and the application of such, specifically in concept mapping, have been well-described (Anderberg, 1973; Davison, 1983; Everitt, 1980; Kruskal & Wish, 1979; Trochim, 1989a, b; 1993). Rather than reiterating these details here, the following discussion is concerned with implementing the Concept System in the context of this study and providing an overview of relevant calculations related to pattern matching and bridging calculations.



A reference code and password for data access were given to each participant to preserve his or her confidentiality and improve convenience for analysis. The sorting criteria data, as well as the importance rating data, were captured in a single project database for analysis. In this way, individual maps could be generated for each stakeholder group and pattern matches could be performed both between (inter-group) groups.

A single concept-map interpretation session was held with all three groups, as described previously, to allow the stakeholder groups to discuss, interpret, and agree on the final content of the group's respective map. A sample cluster map solution, derived by the researcher after the initial brainstorming session, was used as the starting point for each interpretation session. The results of these interpretation sessions produced the final concept maps. These maps also formed the basis of subsequent pattern-matching analyses. The analysis process associated with pattern matching is described next.

#### *Pattern-Matching Analysis*

In addition to the single group concept map, the main analysis of this phase involved pattern matching across the three stakeholder groups. Pattern matching is a general method that can use concept-mapping information in various ways (cf. Caracelli, 1989; Davis, 1989; Marquart, 1989; Trochim, 1985). The Concept System software performs pattern matching at the map cluster level. Pattern matching allows for the combination of any two measures aggregated at the cluster level to understand to what degree the measures match or whether they disconnect. By examining such combinations of measures, similarities and differences between stakeholder groups can then be

identified. According to Trochim (1990, 1998), pattern matching is powerful in its implications, particularly as a measure of divergence across groups. Pattern matching always involves two patterns. The patterns are based on measurements taken at the statement level, which produce the performance criteria. Almost any kind of measure can be used, depending on the purpose. For the present study, this involved exploration of relationships in stakeholder perceptions of the importance of KPIs to be used in the e-LEI and in the evaluation of the organizational e-learning program effectiveness.

A pattern match itself consists of two elements. First, there is the visual picture of the match. Second, every pattern match has a correlation coefficient associated with it. The visual picture of the match is shown through a ladder graph, which is essentially two vertical scales (one for each measure) joined by horizontal lines for each cluster, showing comparative performance on the two measures. If the match is a perfect one, the lines are all horizontal and the resulting graph resembles a ladder of sorts. Ladder graphs are especially useful for quickly spotting disconnects (as negative correlation coefficients) between two measures.

Three variations of pattern matching have been defined to include *outcome*, *consistency*, and *consensus* type (Trochim, 1990, 1996). Of these, only consensus pattern matching was used in the current study. In a consensus pattern match, the theoretical ratings of one group are compared with those of another group as a gauge of agreement or consensus between the measures being compared visually and quantitatively using correlation values. The correlation coefficient associated with each match describes the strength of the relationship or match between the two variables. The correlation ranges

between  $-1$  and  $+1$ . Values near  $0$  indicate the absence of a match; values close to either pole indicate stronger matches. Negative values imply an inverse relationship (when one measure is high, the other is low and vice versa). Positive values imply a synchronic relationship (high with high and low with low). Together, the ladder graph and correlation describe the relationship between the patterns of the two measures.

Since pattern matches are performed comparing two groups at one time, the comparison of three groups with each other would require three main comparisons. Thus, managers' perceptions were compared separately and respectively with those of end-users and performance designers. Similarly, end-users perceptions were compared with those of performance designers. Such pattern-matching combinations result in a series of correlation coefficients and graphical ladder diagrams that were used for stakeholder group comparisons.

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

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

likely to “bridge” between other clusters on the map. Clusters with low bridging values are usually more cohesive, easier to interpret, and reflect the content well in that part of the map.

### *Phase II: Integration into Gilbert’s Performance Requirements Model*

In addition to the KPCs identified in Phase I, Phase II asked the stakeholders to organize the KPCs into the nine dimensions of an effective measurement system within Gilbert’s (1996) performance framework model.

### *Phase III: e-Learning Effectiveness Index (e-LEI) Scorecard*

The KPCs identified and validated using concept mapping and pattern matching were used to build the scorecard data collection survey instrument. The survey applies a framework of indicators grouped by Gilbert’s categories of Quality, Quantity, and Cost to the statement set and allows the stakeholders to rate each statement based on the nine dimensions.

### *Process 1: Adapting Gilbert’s Model*

*Procedure 1: Adapting Quality Measures.* The three dimensions of quality defined by Gilbert are *quality accuracy* (QA), the degree to which a criterion matches a model without errors; *quality class* (QC), the comparative superiority of criteria; and *quality novelty* (QN), the degree of innovation expressed. Each of these quality measures can be related to various criteria defined in the concept-mapping phase. For example, the performance criterion “availability and quality of electronic reference library” can be related to quality accuracy.

*Procedure 2: Adapting Quantity Measures.* The three dimensions of quantity, as defined by Gilbert, are *quantity rate* (QR), productivity measured per unit time; *quantity timeliness* (QT), performance against schedule; and *quantity volume* (QV), bulk or unit production measure. Each quantity measure can be also related to various criteria defined in the concept-mapping phase. For example “number of course registrations” can be related to quantity volume (QV) and quantity rate (QR).

*Procedure 3: Adapting Cost Measures.* The three dimensions of cost, as defined by Gilbert, are *cost labor* (CL), employee time; *cost material* (CM), all material costs; and *cost management* (CMG), all supervisory and managerial resources. Each quantity measure can also be related to various criteria defined in the concept-mapping phase. For example the performance criteria “reduces training travel time” can be related to cost of labor (CL). Similarly, “reduced course material cost” is related to cost of materials (CM).

### *Process 2: Develop Performance Criteria*

*Procedure 1: Categorize Statements.* A spreadsheet survey was designed and programmed to facilitate completion of this procedure. It enabled stakeholders to easily relate the relevance of each of the nine measures to each of the performance criteria statements (statements that were developed during the concept-mapping procedure in Phase I). The data collection survey asked each stakeholder to categorize each performance criterion and then place it into one of Gilbert’s nine performance categories. Each research participant was instructed to perform the following tasks:

- “For each statement listed in the Excel spreadsheet, enter a “1” in one or more of the pertinent cell(s) if you believe the statement is related to any of the Quality,

Quantity, and Cost measures listed in the columns. If you do not believe the statement can be related to any of the nine measures, leave the cell blank.”

- At the time all surveys were returned by e-mail to the researcher, frequencies were counted and totaled for each of the original set of all statements to determine how respondents had categorized each statement in terms of Gilbert’s nine quality, quantity, and cost subcategories. The total frequencies for each category (shown at the top of each bar in the chart) were obtained as follows:
- Each rater reviewed each one of the total statements and allocated it to one or more of the nine categories that the statement relates to best. This review was performed by all of the raters.
- The rater then defined the statement-category relationship for each statement by placing an “x” in one or more cells in the matrix (Excel worksheet). The rows of the matrix contained all statements, one per row. Finally, the columns of the matrix contained all nine categories (Quality Accuracy, Quality Class, etc.), one per column.
- **EXAMPLE:** After carefully reviewing all statements, Rater 1 decides that statements 3, 45, 55, 62, and 88 are related to Quality Novelty. For each of these five statements, the rater places an “x” in the Quality Novelty column-cell corresponding to the statement. Rater 2 decides that only statements 45 and 62 are related to Quality Novelty (and assigns statements 3, 55, 88 to Quality Accuracy). For each rater, the total number of statement-category relationships is determined by a frequency count of the number of x’s in each of the nine columns. Using the

same example (the observations of only two raters), the following would be the resulting category-column totals:

- Quality Novelty column-cell = 7 x's  
(5 from Rater 1 + 2 from Rater 2)
- Quality Accuracy column cell = 3 x's  
(all from Rater 2).

If, for example, the computations of the total number of raters in this study were 14, considering the total of the statements that might be derived from the sample group statements, perhaps 91, in each of the KPI categories (total = 9), then this would give the results as the ones illustrated in Figure 3.7.

Statement	QA	QC	QN	QR	QT	QV	CL	CM	CMG
Presence of measurable learning objectives	10	4	0	2	2	2	2	1	3
Positive trend in test scores	9	4	2	4	1	4	1	0	1
Usability of new knowledge on the job	8	2	1	8	3	4	6	2	4
Improved job performance	8	4	3	8	9	7	8	1	4
Delivery system performance and reliability	8	5	0	3	5	2	3	1	2
Improved computer usage and skills	7	3	1	4	4	4	6	2	1
Improves associate performance	7	4	1	4	2	4	9	0	4
Improved customer service	7	6	4	3	5	2	3	0	3
Percentage of skills transferred to the job	6	3	0	9	5	5	6	0	4

Figure 3.7 Stakeholder Integration of Performance Criteria into Gilbert's Model

*Procedure 2: Extract Final Criteria Statements.* The average importance ratings from the concept mapping in Phase I were used to identify a subset of all statements that averaged 3.50 or higher in importance. By combining similar statements and further selecting only those appropriate for conversion to a clear, concise, and equally representative set of item statements that could be easily rated in survey form, this subset of statements was further

refined to a final set of approximately 41 statements distributed across the nine indicator categories. Limiting the number of KPCs enhances the effectiveness of the scorecard in that it limits the time at task for employees who will be using the electronic survey in the future to rate the e-learning program effectiveness. A sample of the expected outcome is demonstrated in Figure 3.8 with a limited number of performance criteria.



<b>QUALITY</b>
<b>ACCURACY:</b> The degree to which a criteria matches a model without errors
The learning objectives of the e-Learning program are measurable
The e-Learning Program improves computer skills of learners
<b>CLASS:</b> The comparative superiority of criteria
The e-Learning Program improves our core competencies
Learners are satisfied with the e-Learning program
<b>NOVELTY:</b> The degree of innovation represented
The e-Learning Program promotes interactive learning
The e-Learning Program promotes employee career development
The e-Learning Program accommodates multiple styles of learning
<b>QUANTITY</b>
<b>RATE:</b> A productivity measure per unit time
The e-Learning Program increases usable knowledge for Associates
The e-Learning Program increases new skill transfer to the job
The e-Learning Program improves learning efficiency
<b>TIMELINESS:</b> A measure of performance against schedule
The e-Learning Program improves job performance immediately
The e-Learning Program enables new skills to be immediately demonstrable
<b>VOLUME:</b> A measure of bulk or unit production
The e-Learning Program improves job capacity
The e-Learning Program includes a sufficiently wide variety of topics
<b>COST</b>
<b>LABOR:</b> Employee time
The e-Learning Program reduces learning cost
The e-Learning Program is easy to access
The e-Learning Program helps to attract/retain Associates
<b>MATERIAL:</b> Cost of all material production resources
The e-Learning Program content is up to date
The e-Learning Program includes detailed content outlines
<b>MANAGEMENT:</b> includes the cost of all managerial resources
The e-Learning Program improves manager coursework planning
The e-Learning Program improves organizational performance
The e-Learning Program improves communications

Figure 3.8 Final Statement Categorizations Adapted to Gilbert’s Model

*PHASE III: Developing the e-LEI Scorecard and Corporate e-Learning*

*Supervisor Interviews*

Within Phase III of this research study, Part A included the development, deployment, and data collection of the e-Learning Program Effectiveness survey and the conversion of the results into the e-LEI. In Part B, an interview guide was developed and interviews were performed with corporate e-learning program supervisors that included

the case organization and two other companies located in the United States. The results of these interviews were correlated and are discussed in Chapter 4.

The e-LEI scorecard represents the culmination and integration of all phases and procedures described thus far. To review, the concept-mapping and pattern-matching phase was used to produce, compare, and validate among stakeholders an overall set of statements describing the KPCs for measuring e-learning program effectiveness. These results were then applied to Gilbert's (1996) Performance Requirements model using three categories and nine subcategories related to quality, quantity, and cost in the e-LEI scorecard development phase. The e-LEI utilizes and ties together these results by developing a pure index measure based upon a final survey instrument that was deployed within the case organization to assess key program stakeholder perceptions of e-learning program effectiveness. Through periodic repetition and application of the e-LEI survey produces an Aligned Scorecard index is produced that can monitor program effectiveness over time, for example, monthly or quarterly. The following procedures were used to develop the e-LEI survey instrument and to generate the final Aligned Scorecard indices.

*Process 1: Develop e-Learning Effectiveness Index (e-LEI) Survey Instrument*

*Procedure 1: Develop Survey Instrument.* The e-LEI survey was developed from the final performance criteria statement categorizations as shown in Table 3.1. Each performance criteria statement item was incorporated into a survey and included a rating scale that used the familiar 5-point Likert agreement scale: 1) Disagree, 2) Somewhat disagree, 3) Somewhat agree, 4) Agree, or 5) Not applicable.

The e-LEI survey was developed following general techniques of good survey design (Bourque & Fielder, 1995; Fink, 1995; Mangione, 1995; Miller, 1994; Rosenberg, 1968). Realizing that because the survey instrument was developed primarily in relation to the research project as a new instrument and, therefore, cannot demonstrate a long history to compare certain aspects of reliability and validity, these areas were nevertheless taken into consideration. For example, the instrument's stability (test-retest reliability) and alternate-form reliability are obviously not known due to its single form and instance of administration.

Pilot testing of the survey instrument was completed by emailing the survey instrument as a spreadsheet attachment to four members of the target population who had agreed to complete it and provide feedback for improvement. These individuals did not participate in the actual research survey to the sample population. Comments from these individuals were captured and used to ensure the appropriate level of language and usage of terms understandable to the target population. Face validity was also examined by discussing the overall look, readability, time, and ease of completion.

The survey instrument includes seven primary data collection sections that are called Key Performance Indicators (KPIs) and include a total of n=42 KPCs that were developed in the concept-mapping phase. The KPI groups are as follows:

1. Job Performance and Improvement used 6 KPCs from a possible selection of 16, with the highest KPC being ranked in terms of importance at 4.82, the lowest KPC at 4.14 with the mean at 4.47.

2. Career Enhancement used 5 KPCs from a possible selection of 7, with the highest KPC being ranked in terms of importance at 4.36, the lowest KPC at 3.77 with the mean at 4.05.
3. Business Impact used 7 KPCs from a possible selection of 13, with the highest KPC being ranked in terms of importance at 4.41, the lowest KPC at 3.95 with the mean at 4.14.
4. Organizational Sponsorship/Commitment used 6 KPCs from a possible selection of 9, with the highest KPC being ranked in terms of importance at 4.27, the lowest KPC at 3.64 with the mean at 3.98.
5. Curriculum Level Measures used 6 KPCs from a possible selection of 21, with the highest KPC being ranked in terms of importance at 4.14, the lowest KPC at 3.73 with the mean at 3.95.
6. Objective Training Measures used 6 KPCs from a possible selection of 8, with the highest KPC being ranked in terms of importance at 4.18, the lowest KPC at 3.64 with the mean at 3.87.
7. Course Delivery/Usability used 6 KPCs from a possible selection of 17, with the highest KPC being ranked in terms of importance at 4.59, the lowest KPC at 3.95 with the mean at 4.27.

In an effort to not create an end-user e-LEI survey that would be perceived by the sample respondents as too time-consuming and cumbersome to complete, the three stakeholder groups in Phase II decided that each KPI group within the survey should have between 5 and 7 KPCs with an importance rating not lower than 3.50, as determined in

Phase I in the concept-mapping activity. Of the 7 KPI groups selected to be used in the e-LEI survey, a total of 42 KPCs were used. The highest KPC in terms of importance was ranked at 4.82 and came from the Job Performance and Improvement KPI group; the lowest KPC was ranked at 3.64 and came from both the Organizational Sponsorship/Commitment KPI group and the Objective Training Metrics KPI group. The overall mean for all statements used within the e-LEI survey instrument was 4.10.

As noted above, a 5-point attitudinal Likert-type scale was used for all items (disagree to agree) in the e-LEI survey. Similarly, as taken from the survey instrument section, only the demographic data about respondent job classification (i.e., manager, performance designer, or e-learning end-user) were used in the current study (see Table 3.1). The data points for each KPI were calculated in a single data collection event from the e-LEI survey, which can be administered on a periodic basis, for example, each month. In this research, the e-Learning Program Effectiveness survey was administered once, to a random sample (n=16) from the stakeholder groups of managers, performance designers, and end-users.

Table 3.1 The e-Learning Program Effectiveness Survey

Please read each Key Performance Criteria statement in the sections below and then circle a number from 1-4 to rate the criteria. (1=lowest and 4=highest). If you are do not think the KPC statement is applicable, then circle NA in the Not Applicable column.	Dis-agree	Some-what Disagree	Some-what Agree	Agree	Not App-licable
<b>Affecting my Job Performance.</b>					
My on-the-job performance has improved from training.	1	2	3	4	NA
I am able to use the new knowledge from my e-learning training in my job.	1	2	3	4	NA

My performance as an associate has improved due to the learning I acquired from our e-learning program.	1	2	3	4	NA
The number of skills I can transfer to my job has increased due to the e-learning training that I have taken.	1	2	3	4	NA
I have learned information relevant to current projects and projects planned for the future from our e-learning program.	1	2	3	4	NA
I have acquired new skills and received knowledge faster from our e-learning program.	1	2	3	4	NA
<b>Enhancing my Career.</b>					
My e-learning training has assisted my growth and career development.	1	2	3	4	NA
My e-learning training has supported me in assisting in the strategic business direction of our company.	1	2	3	4	NA
My communication skills have improved through the use of our e-learning programs.	1	2	3	4	NA
I have benefited from this training provided by e-learning.	1	2	3	4	NA
The company's recruiting ability has improved due to our e-learning programs.	1	2	3	4	NA
<b>Impacting our Business.</b>					
The servicing of my internal customers has improved as an outcome of the e-learning training	1	2	3	4	NA

I have taken.					
My core competencies levels for my job performance have improved because of our e-learning program.	1	2	3	4	NA
Our company's overall organizational performance has improved due to our e-learning programs that are available.	1	2	3	4	NA
I have felt my overall satisfaction and job morale has increased due to our e-learning program.	1	2	3	4	NA
Our company's profitability has grown as an outcome of our e-learning program.	1	2	3	4	NA
Best practices and new technology training has been delivered as required through the use of our e-learning programs.	1	2	3	4	NA
<b>Determining Organizational Sponsorship and Commitment.</b>					
Management has encouraged me to take training at work.	1	2	3	4	NA
Management has been more supportive of my work after taking e-learning training for my job.	1	2	3	4	NA
A learning environment has been fostered at our company.	1	2	3	4	NA
Learning has been integrated with the performance review process.	1	2	3	4	NA
Supervisors have been able to observe my learning progress through our e-learning system.	1	2	3	4	NA

My training records are available for review and management.	1	2	3	4	NA
<b>Measuring e-Learning Curriculum.</b>					
I found course navigation from screen to screen has been easy in the e-learning training.	1	2	3	4	NA
This e-learning training is "just-in-time" for my job needs.	1	2	3	4	NA
This e-learning training has been interesting and has kept my attention.	1	2	3	4	NA
Access to the e-learning training has been easy.	1	2	3	4	NA
The modular structure of our e-learning training has allowed each course to build on another.	1	2	3	4	NA
This e-learning training has accommodated multiple learning styles.	1	2	3	4	NA
<b>Quantifying Training Metrics.</b>					
The e-learning courses contain measurable learning objectives.	1	2	3	4	NA
My performance has improved from the pre-course to the post-course when I take e-learning training.	1	2	3	4	NA
My cost for travel associated with training has been reduced.	1	2	3	4	NA
Time lost from work for training travel has decreased due to our e-learning programs.	1	2	3	4	NA
My course material costs were less with this e-learning training.	1	2	3	4	NA



My time required to take new required training has been reduced by having our e-learning program.	1	2	3	4	NA
<b>Appraising Course Delivery / Usability.</b>					
The e-learning program has current business updates incorporated into all training delivered.	1	2	3	4	NA
The e-learning delivery system performed and was reliable.	1	2	3	4	NA
My learner's satisfaction level has increased due to our e-learning program.	1	2	3	4	NA
Our e-learning program provides a broad range of course topics to meet my current learning needs.	1	2	3	4	NA
My learning tracks have been clearly defined within the learning system.	1	2	3	4	NA
Learning has been fun—an enjoyable work activity.	1	2	3	4	NA

*Process 3: Deployment of the (e-LEI) Survey Instrument*

*Procedure 1: Deploy Survey to Sample Group.* The survey instrument was deployed both randomly and anonymously. To encourage participation and to improve the overall completion rate, pre-notification of all potential sample group respondents was accomplished by using the company's internal email systems and was distributed through email one week before the e-LEI survey was sent out. A similar follow-up email was sent out as a reminder one week after the original research survey was emailed out.

The email survey package contained two items of documentation: an email cover letter, and the survey instrument as an attachment. A recommended return period of

five business days was suggested in the cover email. To accommodate illnesses and vacations, a total period of two weeks was allowed for responses. The cover letter accompanying the survey was drafted by the principal researcher and signed by the company's Director of Research and Strategy. The director's signature was used because, unlike that of the researcher, his name was well recognized among the potential sample group within the organization. Cover letter name familiarity has been demonstrated to be beneficial in increasing survey response rates (Bourque & Fielder, 1995).

*Procedure 2: Capture and Correlate Survey Results from Sample Group.* A total of 30 random e-learning end-users were asked to participate in the e-Learning Program Effectiveness survey. A total of 16 surveys were returned by the participants within the two-week period by internal mail within the case organization. The data from each survey were entered into a spreadsheet for each of the 16 respondents. The data were then analyzed as described in Procedure 3.

*Procedure 3: Analyze and Compare Data from Sample Group.* The format of the data was the primary criterion used to select the general analytical procedures. All statistical analyses were performed using *SPSS for Windows (9.0)* software. Survey data were copied and pasted from the spreadsheet into SPSS for analysis. In addition to item-level descriptive statistics such as number of respondents, item mean, and standard deviations, several other procedures commonly used for survey response analysis were used in the data analysis and the development of the e-LEI scorecard. Using the research framework and results from the prior phases, individual survey items were grouped together conceptually to calculate a reduced set of scale variables as linear combinations of item

rating averages. For each of the performance criterion within the survey instrument that the respondents replied to, a weight was given to each of the scales from 1 to 5. A weighted scale was used as follows: Disagree = 1, Somewhat disagree =2, Somewhat agree =3, and Agree =4. A final scale of Not applicable (=0) was used so that the end-users could respond if they did not think the performance criterion was applicable to them or if they did not understand the question. All weights were summed up for each of the performance criterion, then totaled and divided by the number of total performance criteria that the e-learning program was evaluated on. Table 3.2 demonstrates the calculation procedure in determining the percentage score for each respondent.

Table 3.2 Calculating Percent Score for the e-Learning Program Effectiveness Survey Instrument

Key Performance Criteria (Total n=50)	Disagree	Somewhat	Somewhat	Agree	NA
		Disagree	Agree		
Key Performance Criterion # 1	1 X	2	3	4	NA
Key Performance Criterion # 2	1	2	3	4 X	NA
Key Performance Criterion # 3	1	2	3 X	4	NA
Key Performance Criterion # 4	1	2	3 X	4	NA
Key Performance Criterion # 5	1	2	3	4 X	NA
Totals:	(1x1)=1	0	(3x2)=6	(4x2)=8	NA

**Add column totals to find SUM: 15**

**Total number of KPCs: n=5**

By using this formula, it is possible to calculate the percentage for each of the nine Gilbert categories giving the new KPIs:

$$\frac{(\text{SUM}-N)}{N} \times 25 = \frac{(15-5)}{5} \times 25 = 50.0 \quad \text{Percentage Score} = 50.0\%$$

Once each respondent's survey was calculated into KPI percentages, the next procedure averaged all respondents' KPIs together so that an indice for each performance criteria group (n=7), (for example; Business Impact) could be created and input into the e-LEI scorecard as a metric (see Table 3.3).

**Table 3.3 Determining Key Performance Indicator Metrics**

<b>Key Performance Indicator</b>	<b>Business Impact</b>
Number of respondents	16
Average percentage score averaged between respondents for this KPI	55%

The same procedure was used to calculate each of the seven KPI groups from all of the respondents' data. Once the mean scores had been determined, the next step was to enter the data into the spreadsheet. For the purpose of this research, only one data

collection activity occurred in order to validate this procedure. The results of this procedure are discussed in detail in Chapter 4.

### *Phase III: e-Learning Supervisor Interviews*

In addition to the e-Learning Program Effectiveness survey performed in Part A of Phase III, interviewing e-learning supervisors outside of the case organization provided the principal means for data collection and analysis as part of measuring the reaction and satisfaction of the e-Learning Program Effectiveness survey and the overall procedure and methodology of determining KPCs and KPIs in measuring e-learning program effectiveness. Beyond using interviews for data collection, its use across a wide range of fields and disciplines in the social sciences, this method also has an emerging history of application specifically for training and group learning-related research in large organizations (Brown & Duguid, 1991; Shayo & Olfman, 1993).

The main purpose of Phase III was to address the third research question by further exploring differences in perceptions among stakeholders about the usefulness and effectiveness of the e-Learning Effectiveness Index, which explores organizational stakeholders' perceptions regarding their views about e-learning program effectiveness. To this end, Phase III Part B also served to clarify, interpret, and extend the findings from phase I and Phase III Part A. This was done by obtaining data on individual views about the concept map and the e-learning program effectiveness survey instrument produced by their stakeholder group (individual validation of group results) and then discussing the purposes, processes, and consequences of how effective this procedure and set of tools were in helping e-learning supervisors better understand if their e-learning programs were

producing the results that they expected.

### *Sample and Procedure*

Participants (n=10) from different Fortune 250 companies who actively use e-learning as part of their entire learning and development were randomly selected and invited to participate in Phase III Part B. A total of three (n=3) individuals with supervisory roles in their corporate e-learning programs agreed to be interviewed. Individual private interview sessions were scheduled with each supervisor in the different companies. Before each interview, permission was specifically requested and obtained to audio-tape the session. Realizing that the length of interviews probably would vary (depending on the length, depth, and complexity of any given respondent's reply), each interview was scheduled for one hour in duration.

All interviews were conducted by phone call by the researcher. The researcher was familiar with each of the organizations and the participants being interviewed. His affiliation with the case organization was a methodological asset based on a shared organizational and program experience with the respondents. According to Holstein and Gubrium (1995), such prior experience "...provides direction and precedent, connecting the researcher's interest to the respondent's experience, bridging the concrete and abstract" (p. 46). This situation promoted useful common awareness that could be referenced as a way of linking the respondent's experiential perceptions to the researcher's more conceptual issues and questions.

The e-learning supervisors who participated in the interviews in Phase III Part B had varying experiences. The first was an e-learning manager in a global human resources consulting and outsourcing company with 40,000 employees worldwide. She

had held that position for three years. His company had been offering e-learning courses and virtual classroom events for 6 years through an LMS called SumTotal, which also includes a Learning Content Management System (LCMS). The second supervisor worked as an e-learning coordinator for a boutique e-learning development firm providing high-end simulation/gaming-based courseware and EPSS systems. He had been two years in that position. The company, located in Texas, has 61 employees. They have been offering e-learning courses and virtual classroom events for 3 years on an externally hosted LMS from a vendor; they also deliver virtual classroom events through an external vendor. The third supervisor interviewed had been a performance technology manager for 18 months for an e-learning content development company with 4,500 employees located on six continents. They had been offering e-learning courses for over two year on an LMS called SABA, which also included an LCMS.

In view of the third research question, how can KPIs be used in the development of an e-LEI scorecard, an interview guide was developed to facilitate the semi-structured interviews. According to Borg and Gall (1989), the semi-structured interview has the advantage of being reasonably objective while still permitting a thorough understanding of the respondent's opinions and the reasoning behind them.

A semi-structured interview guide was developed and used for the one-on-one interviews. Pilot testing of the instrument was performed using two individuals from each of the three stakeholder groups who did not participate in the study during any phase. The pilot testing process involved use of the instrument in a single mock interview session with each participant and was combined with a thorough post-interview debriefing that sought feedback on the quality and clarity of the interview questions. Detailed notes were

taken, reviewed, and used to improve the wording, phrasing, and content of the semi-structured questionnaire guide. The interview instrument was revised and refined, then updated based on the pilot tests performed.

The final interview guide was organized into three main parts. Part A of the instrument sought to explain the process of developing KPCs, integrating them into Gilbert's model, and creating the e-Learning Program Effectiveness survey. This was accomplished by showing each interview participant the concept map (generated in Phase I). This map depicted a stakeholder group-level view of KPCs that could be used in evaluating e-learning programs as well as the perceived ranking of importance of each KPC. In addition, it was explained to each interview participant how the entire process to develop the e-Learning Program Effectiveness survey was designed so that they would have a clear understanding of the process. Finally, the e-Learning Program Effectiveness survey was shown in its final format. Part B of the guide showed an example of how the data from the surveys would look after it had been collected from a sample population and analyzed. This demonstrated what the survey would provide in its final format and how it would be converted into a graphical representation into the e-LEI. Part C of the interview guide was included to further explore explicit perceptual opinions from the participants regarding the design methodology and the overall usefulness of the e-LEI scorecard and possible implications for its use within their organization. The interview guide is contained in Appendix D.

All interviews were audio-taped and transcribed verbatim in MS Word™ to enhance descriptive validity as discussed by Maxwell (1996). To enhance audio quality for accurate transcription, special care was taken to use high-quality recording



equipment, including a good-quality multi-channel recording unit with variable tape speed control using a single microphone (Olympus Pearlrecorder S701). For redundancy (in case the audio-cassette recorder failed during an interview), another audio-cassette recorder was available to continue the interview with the participants. This equipment produced a good set of three 45-minute cassette tapes containing the interview data, which was transcribed to text.

These data were analyzed and correlated into one master set of interview responses. The researcher removed redundancies between responses to enhance clarity and removed any wording that did not contribute to the actual responses being made by each participant.

Finally, an effort was made to construct themes from the data (Rubin & Rubin, 1995), for the purpose of developing tentative explanations and relationships among questions and emerging constructs. This approach helped pull together a lot of material into more meaningful and parsimonious units of analysis for enhanced interpretation. Appendix D contains the three completed transcripts and the summary transcript for all three interviews.

The final interview summary depicts the perceptions by these three corporate supervisors of e-learning programs about the usefulness and possible application of the e-LE I scorecard procedure and tool in any organization that utilizes e-learning as part of the overall learning and performance strategy.

Upon completion of Phase III of this research, an executive presentation of the results was made to the case organization. This event was attended by six senior managers and directors from the Information Technology, Human Resources, and

Performance Technology departments. The presentation took 30 minutes and finished with a question and answer period.

The case study organization supported the researcher in collectively stating that improvements made to its existing e-learning program could be enhanced through the use and application of a procedure and tool such as the e-Learning Effectiveness Index scorecard. Some of the benefits noted of an e-learning aligned scorecard as a program evaluation system included the following:

- The process provides insight into understanding different stakeholders' perceptions about key performance criteria that could be used for evaluating the effectiveness of e-learning programs.
- The research results provide quantitative data allowing management to modify, enhance, and improve e-learning programs on an on-going basis.
- The process ensures that any e-learning program is aligned with organizational goals and strategies.
- The results provide management insight on trends and patterns based on e-learning effectiveness perceptions that is derived from the e-LEI scorecard process and results.

## CHAPTER 4

### RESULTS

The purpose of Phase I as discussed in Chapter 3 was to answer the first two research questions concerning what key performance criteria (KPCs) could contribute to developing a procedure to measure the effectiveness of an e-learning program within an organization and to what extent stakeholder groups differ in their perception about the KPCs and their importance in evaluating e-learning programs. The KPCs to be used in measuring e-learning program effectiveness here are represented in a single concept map. The map includes all 91 statements within the cluster groupings identified and labeled by each group. The three sets of statements from the groups were then reviewed, and statements that were similar or repeated between groups were removed to create a single set of statements. In addition to the generation of statements to describe the KPCs, all members of each group also rated each statement based on how they perceived that deciding on the level of importance could contribute to creating a metric in measuring e-learning program effectiveness. The importance ratings provided the opportunity to perform pattern-matching analyses between groups.

Three stakeholder groups participated in this study: managers (n=13), performance designers (n= 10), and e-learning end-users (n=13), with a total stakeholder population of 36. Each group brainstormed and created statements that the stakeholders conceptualized as being key performance criteria. The manager stakeholder group created 62 statements, while the end-user stakeholder group developed 109 statements and the performance designer stakeholder group conceptualized 86 statements. The collective

number of KPC statements generated was 121. (See Appendix B for the three separate stakeholder statements.) Of the total 121 KPC statements, the 3 sample groups worked collectively and reviewed the total statements, then removed any statements that were redundant, unclear, or had been repeated between groups. The final set of statements is presented in Figure 4.1 in the order and form in which they were captured by the stakeholder groups.

- Percentage of skills transferred to the job
- Increased use of e-Learning
- Usability of new knowledge on the job
- Improved test scores
- Number of courses completed (required and optional)
- Number of course registrations
- Improved level of learner satisfaction
- Improved job performance
- Aids or assists growth and career development
- Degree of management support
- Improved associate satisfaction and morale
- Improved customer service
- Reduced learning time
- Number of hits to online course catalog
- Ease of course availability
- Ease of course accessibility
- Ease of course navigation
- Number of requests for additional courses
- Accommodation of multiple learning styles
- Low course abandonment rate
- Improved work group effectiveness
- Positive informal feedback (word-of-mouth)
- Ability to access training outside of work
- Level of associate participation after-hours
- Increased rate of internal promotion
- Courses are short in duration
- Improves talent recruitment and retention
- Courses keep learner's attention
- Promotes continuous learning
- Improves associate performance
- Improves profitability
- Increased sales
- Improves company pride and brand name
- Pre-/Post-course performance improvement
- Presence of measurable learning objectives
- Course availability for all levels of learners
- Promotes associate empowerment
- Percentage of course evaluations completed
- Learner suggestions are actively solicited and acted upon for course improvement
- Reduces associate percentage with below-average performance

e-Learning is perceived as an associate benefit  
 Improved associate reading skills  
 Rate of voluntary course participation  
 Improved computer usage and skills  
 Improved ability to unlearn and relearn  
 Reduces information overload  
 Reduced training travel time  
 Reduced training travel cost  
 Fosters an environment in which management encourages associates to train at work  
 Rewards and incentives for successful course completion  
 Reduced course material cost  
 Provides “just-in-time” learning  
 Teaches corporate programming standards  
 Number of associate certifications  
 Improves WD’s core competencies  
 Level of interactivity and feedback  
 Access to published literature  
 Delivers best practices and new technology  
 Teaches WD-specific methods  
 Provides summary recap, “walk-aways,” job aids  
 Modularized courses build upon each other  
 e-Learner records easily available for review and self-management  
 Presence of detailed syllabus and prerequisites for all courses  
 Learning tracks are clearly defined  
 Increased associate collaboration  
 Relevance to current or planned projects  
 Learning is fun!  
 New hire (new associate) course availability  
 Improved scorecards in various areas  
 Availability of training 24-7, year-round  
 Course content currency (courses up-to-date)  
 Delivery system performance and reliability  
 Supports and complements mentoring  
 Accredited courses (e.g., college credits, CEUs, degree program, advanced degree program)  
 Improves coursework planning with management  
 Learning is integrated with performance reviews process  
 Availability and quality of electronic reference library  
 Provides opportunities for immediate skill demonstration  
 Increases organizational intelligence (Are we smarter?)  
 Improves organizational performance  
 Enables supervisory observance of learner progress  
 Improves speed of acquiring new knowledge and skill  
 Fosters a learning environment  
 Accommodates remedial training  
 Supports strategic direction of business  
 Improves company reputation for recruiting  
 Breadth of course subjects available (e.g., technology, business, leadership, etc.)  
 Improves ability to meet project milestones  
 Improved learning efficiency  
 Reduces complexity of our systems  
 Improves communications

Figure 4.1 Final Edited Statements by the 3 Stakeholder Groups

In addition to the three stakeholder groups creating statements to describe the KPCs to be used to measure e-learning program effectiveness, all sample group participants also rated the relative importance of each statement as a criterion in the overall evaluation of e-learning program effectiveness. The complete set of ratings can be found in Appendix D.

#### Phase I: Results of Concept Mapping and Pattern Matching

A final concept map was created by the researcher utilizing the final set of performance criteria statements and their ranked importance as input to the concept mapping software. (See Figure 4.2.) The three stakeholder groups defined seven conceptual clusters which I term KPIs. In order of average general importance, they were (1) *job performance and improvement* ( $\underline{M}=3.97$ ); (2) *business impact* ( $\underline{M}=3.92$ ); and (3) *organizational sponsorship and commitment* ( $\underline{M}=3.82$ ). Tied as an average mean to the third cluster were (4) *course delivery and usability* ( $\underline{M}=3.82$ ); (5) *career enhancement* ( $\underline{M}=3.82$ ); (6) *objective training metrics* ( $\underline{M}=3.73$ ); and (7) *curriculum level measures* ( $\underline{M}=3.27$ ). It is important to note that all statements described specific performance criteria that could be used to evaluate the effectiveness of an e-learning program. Among the statements ranked highest in the most important rated cluster, job performance and improvement, were *improved job performance* ( $\underline{M}=4.82$ ) *usability of new knowledge on the job* ( $\underline{M}=4.64$ ); and *improves associate performance* ( $\underline{M}=4.64$ ). In the second most important cluster, *business impact*, the most important statements were *improved customer service* ( $\underline{M}=4.41$ ); *improves company's core competencies* ( $\underline{M}=4.32$ ); and *improved organization performance* ( $\underline{M}=4.23$ ). In the third most important rated cluster called *organizational sponsorship and commitment*, which had the same average mean as

the fourth cluster, the most important statements were *fosters an environment in which management encourages associates to train at work* ( $\underline{M}=4.27$ ), *degree of management*

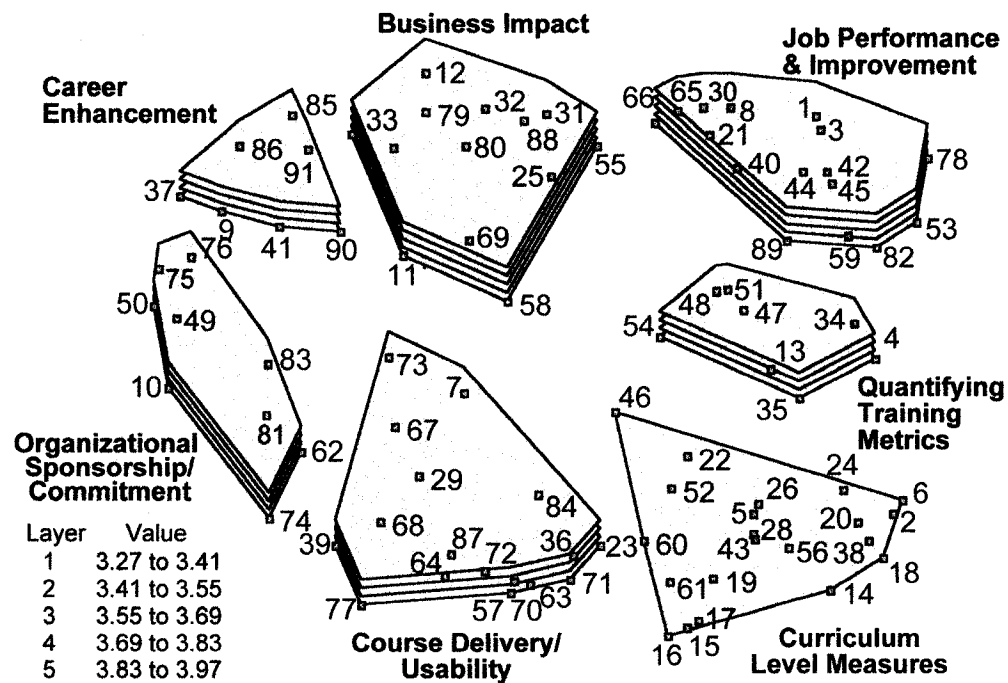


Figure 4.2 Final Combined Concept Map from the Three Stakeholder Groups

*support* ( $\underline{M}=4.23$ ), and *fosters a learning environment* ( $\underline{M}=4.14$ ). In the fourth most important rated cluster, *course delivery and usability*, the most important statements were *courses up-to-date* ( $\underline{M}=4.59$ ), *delivery system performance and reliability* ( $\underline{M}=4.45$ ), and *learner satisfaction* ( $\underline{M}=4.23$ ). In the fifth most important rated cluster, *career enhancement*, the most important statements were *assists growth and career development* ( $\underline{M}=4.36$ ), *supports strategic direction of business* ( $\underline{M}=4.32$ ), and *improves communication* ( $\underline{M}=4.05$ ). In the sixth most important rated cluster, *objective training metrics*, the most important statements were *measurable learning objectives* ( $\underline{M}=4.18$ ), *pre-/post-course performance improvement* ( $\underline{M}=4.05$ ), and *reduced training travel costs* ( $\underline{M}=3.91$ ). Finally in the seventh most important rated cluster called *curriculum level*

*measures*, the most important statements were *ease of course navigation* ( $\underline{M}=4.14$ ), and tied in importance were *provides just-in-time learning* ( $\underline{M}=4.14$ ), *courses keep learner's attention* ( $\underline{M}=4.00$ ). It is interesting to note that of the five statements rated the highest in importance *improved job performance* (4.82), *usability of new knowledge on the job* (4.64), *improves organizational performance* (4.64), *courses up-to-date* (4.59), and *percentage of skills transferred to the job* (4.45), there appears to be a primary focus on the learner's ability to acquire new knowledge and to apply it effectively on the job. Only one statement focuses on the learning organization's ability to manage the e-learning program (*courses up-to-date*).

Pattern-matching techniques were applied to examine the sample group differences in perceptions concerning which KPCs are more important in the evaluation of e-learning program effectiveness. A total of three inter-group pattern match correlation coefficients were collected from the analyses performed used the concept-mapping system software. The inter-group pattern matches were used to compare the average cluster importance ratings for each of the seven KPI groupings between the three stakeholder groups. A final map was then created that represented the average importance ratings of the same set of statements between the three stakeholder groups. A comparison of the coefficients between the different stakeholder groups is helpful in revealing and understanding similarity or variation of perception between groups about the statements. In the first pattern-matching analysis between managers and performance designers, Figure 4.3 shows a fairly good agreement on the general importance of KPCs with a correlation coefficient of  $r \geq .82$ . The manager stakeholder group had an importance ranking range from 3.14 to 4.16. In terms of the KPI being perceived to be least



important for the manager group, *curriculum level measures* were at the bottom (ranked at 3.14), while the *job performance improvement* KPI was perceived to be most important with a ranking of 4.16. The performance designers had an importance ranking range from 3.0 to 4.49. Again, *curriculum level measures* was ranked lowest at 3.0, while the *business impact* KPI was perceived to be most important with a ranking of 4.49.

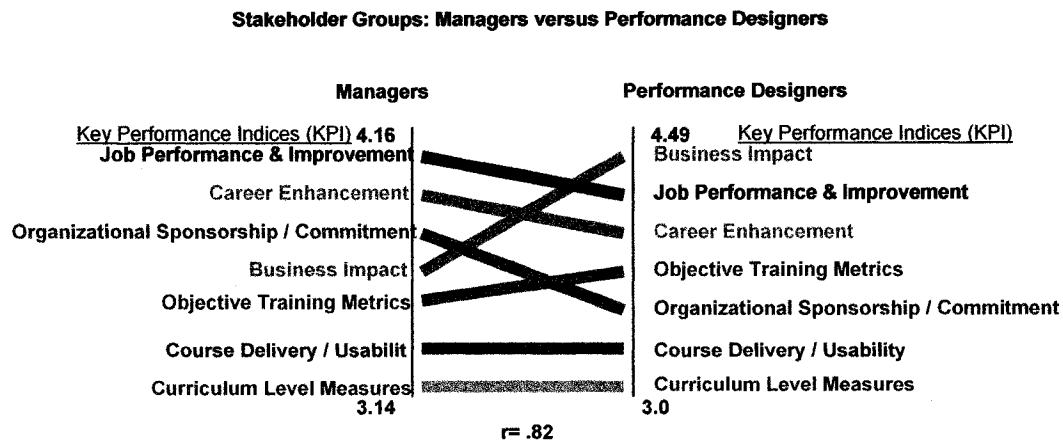


Figure 4.3 Pattern Matching between Managers and Performance Designers

In the second-pattern matching analysis between managers and e-learning end-users, Figure 4.4 shows the greatest consensus of all three pattern matches performed on the general importance of KPCs with a correlation coefficient of  $r \geq .89$ . The manager stakeholder group had an importance ranking range from 3.14 to 4.16. The *curriculum level measures* KPI was at the bottom ranked at 3.14, while *the job performance and improvement* KPI was perceived to be most important with a ranking of 4.16.

While the end-users had an importance ranking range from 3.32 to 3.92, the KPI group perceived as least important again was the *curriculum level measures*, ranked at 3.32, while *the job performance and improvement* KPI was most important with a ranking of 3.92. This confirms that both the manager group and end-user group were in agreement on the least and most important KPIs.

Stakeholder Groups: Managers versus End-users

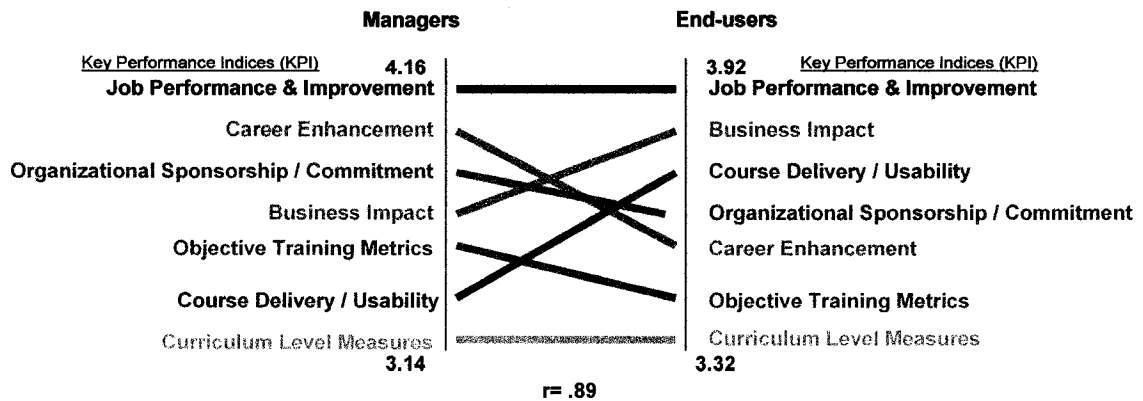


Figure 4.4 Pattern Matching between Managers and End-Users

In the third and final pattern-matching analysis, between the organization's e-learning end-users and performance designers, Figure 4.5 shows the least amount of consensus of all three pattern matches as to the general importance KPCs. The correlation coefficient is  $r \geq .78$ . The performance designer group had an importance ranking range from 3.00 to 4.49. In terms of the KPI perceived to be least important for the performance designer group, *curriculum level measures* ranked at the bottom with 3.00, while the *business impact* KPI was perceived to be most important with a ranking of 4.49.

While the end-users collectively had an importance ranking range from 3.32 to 3.92, the KPI group perceived as least important for the end-user group again was *curriculum level measures* (3.320), while *the job performance and improvement* KPI was perceived to be most important with a ranking of 3.92.

**Stakeholder Groups: End-Users versus Performance Designers**

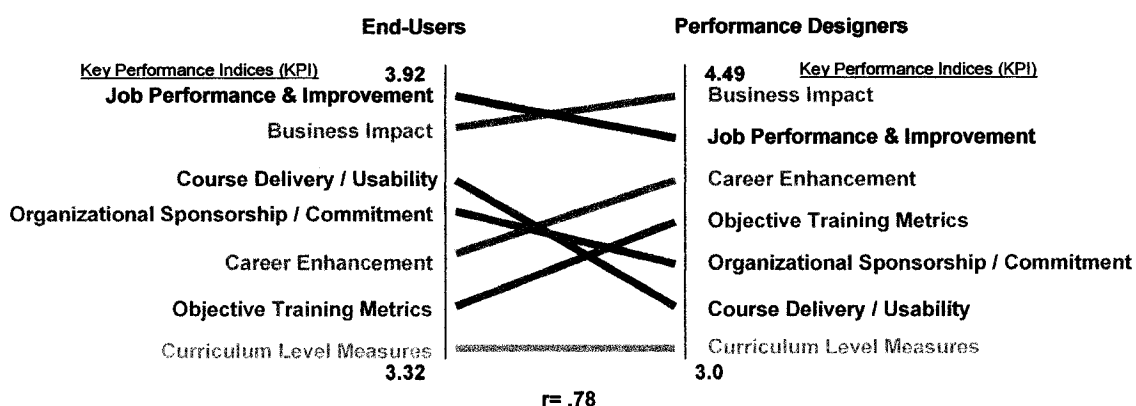


Figure 4.5: Pattern Matching between End-Users and Performance Designers

**Phase II: Integration of Key Performance Criteria into Gilbert’s Performance Model**

In Phase II of this research, the sample group (n=18), which came from a cross-section of all stakeholders groups, were tasked with utilizing the KPC statements identified in the concept-mapping activity in Phase I. They were also asked to categorize the total number of statements (n=91) into one or several of Gilbert’s nine performance criteria categories: quality, quantity, or cost. The results are shown in Appendix C.

In terms of the KPC frequency of selection and placement into Gilbert’s categories, in the Quality-Novelty category, which has to do with the degree of innovation, was selected by the sample group most frequently (n=314), followed by Quality-Class, the comparative superiority of criteria (n=287), and Quality-Accuracy, the degree to which a criterion matches a model (n=287). Gilbert’s second major category, Quantity-Volume, which describes a bulk or unit measure, was selected with the most frequency (n=243) while Quantity-Rate, which describes productivity time per unit time, had a frequency of (n=240) and Quantity-Timeliness, which describes a performance against a schedule, had a selection frequency of (n=216). Finally, Gilbert’s third category

of performance, Cost-Labor, which has to do with the performance of employee time, was the most frequently selected by the stakeholder groups (n=342) followed by Cost-Management, which includes all supervisory and managerial resources (n=318). The lowest selection frequency was Cost-Material (n=132), which describes all material costs. Of the entire nine performance criteria in Gilbert's categories, Cost-Labor (n=342) had the highest selection frequency, followed by Cost-Management (n=318), and Quality-Novelty (n=314). Please see Appendix C.

The selection frequency mean was determined for the three major performance criteria categories from Gilbert's model. The selection frequency mean for the Quality criterion was 3.20, while the Quantity category was 2.56, and the Cost category achieved a mean of 2.90. Within the Quality category and sub-category Quality-Accuracy, the following KPCs had the highest selection frequency: *presence of measurable learning objectives* (n=10), *positive trends in test scores* (n=9), *usability of new knowledge on the job* (n=8), *improved job performance* (n=8), and finally, *delivery system performance and reliability* (n=8). In the Quality-Cost sub-category, the highest selection statement frequencies were *level of learner satisfaction* (n=8), *modularized courses built upon each other* (n=7), *teaches specific methods* (n=6), and *improves company's core competencies* (n=5). In the Quality-Novelty sub-category, the most frequently selected criteria statements were *courses keep learner's attention* (n=9), *learner suggestions were actively solicited and acted upon for course improvement*, *accommodation of multiple learning styles*, and *increases the use of e-learning*, which all received the same selection frequency (n=8). In the next major performance category, Quantity, the sub-category of Quantity-Rate, the following KPCs had the highest selection frequency: *percentage of*

*skills transferred to the job* (n=9), followed by *usability of new knowledge on the job* and *improved job performance* both receiving a selection frequency of 8. In the Quantity-Timeliness sub-category, three criteria statements received the same selection frequency (n=9): *improved job performance*, *reduced learning time*, and *improves ability to meet project milestones*. In the last Quantity category, in the sub-category called Quantity-Volume, the highest selection frequency were *number of course registrations* (n=11), *number of associate certifications* (n=10), and *increased sales* (n=8). In the next major Gilbert category, Cost, the sub-category Cost-Labor, the highest selection frequency went to *reduced training travel time* (n=10); *reduces information overload* and *improves associates performance* both had a frequency of 9. In the Cost-Material sub-category, *reduces training travel cost* was selected most frequently (n=7), followed by four criteria with a rating of 4: *breadth of course subjects available*, *presence of detailed syllabus and prerequisites for each course*, *courses up-to-date*, and *availability and quality of electronic reference library*. In the remaining sub-category Cost-Management, *improves coursework planning* had the highest selection frequency highest (n=11), while *enables supervisory observance of learner progress* was second at 10 and *e-learner records easily available for review and self-management* and *learning is integrated with performance reviews process* both had 9. See Appendix C for all performance criteria selection frequencies placed into Gilbert's model.

The KPC statements selected with the most frequency were *course availability* (n=67), *increases rate of internal promotion* (n=54), *ability to access training outside of work* (n=50), *number of courses completed* (n=49), *learning is fun* (n=48), and, finally, *improves profitability* (n=47). It is interesting to note that three of the most frequently

rated performance criteria were focused around the actual learning system and courses itself, while two criteria, *increases rate of internal promotion* and *learning is fun*, were focused on the end-user perspective. The performance criteria *improves profitability* appears to focus on organizational results coming from an effective e-learning program. See Appendix C for e-learning frequencies across the nine Gilbert categories.

The final activity performed in Phase II was to determine where the top statements (n=20) fell in terms of their perceived level of importance as Key Performance Criteria integrated into Gilbert's model. The Quality category had 8 performance criteria that were integrated into this domain with a mean of 4.39, while both the Quantity and Cost categories had 6 performance criteria in their domains. The mean for the Quantity category was 3.62 while the Cost category's mean was 4.30. The mean of all 20 items was 4.10. See Table 4.1.

Table 4.1 Frequency of KPCs into Gilbert's Performance Model

QUALITY	AVG	QUANTITY	AVG	COST	AVG
Usability of new knowledge on the job 2	4.64	Improved job performance 1	4.82	Improves associate performance 3	4.64
Courses up-to-date 4	4.59	Percentage of skills transferred to the job 9	4.45	Supports strategic direction of business 11	4.32
Delivery system performance and reliability 6	4.45	Relevance to current or planned projects 17	4.18	Fosters an environment in which management encourages associates to train at work 12	4.27
Improved customer service 7	4.41	Breadth of course subjects available (e.g., technology, business, leadership, etc.)17	4.18	Degree of management support 13	4.23
Level of learner satisfaction 8	4.36	Provides "just-in-time" learning 18	4.14	Improves organizational performance 14	4.23
Improved company core competencies 10	4.32	Improves speed of acquiring new knowledge and skill 20	4.14	Ease of course navigation 19	4.14

Improved associate satisfaction and morale 15	4.18			
Presence of measurable learning objectives 16	4.18			
	Group Mean	4.39	Group Mean	3.62
			Group Mean	4.30



The results show that the sample group (n=18) in Phase II ranked more KPC statements into the Quality category, and within the that category, 8 KPC statements were ranked in the top ten in terms of their perceived importance for evaluating e-learning program effectiveness. Both Gilbert's Quantity and Cost categories had 6 KPC statements within the top 20 importance ratings; however, the overall mean importance ranking of Cost ( $\underline{M}$ =4.30) was higher than the overall mean of Quantity ( $\underline{M}$ =3.62). The mean average of the top 20 performance criteria was 4.10.

### Phase III: e-LEI Scorecard and Supervisor Survey

Phase III had two parts. In Part A, a study was conducted in order to answer research Question 3 regarding whether the KPCs integrated into Gilbert's model could be used as benchmark metrics to develop an e-Learning Effectiveness Index (e-LEI), an aligned scorecard providing a framework representing measurable on-going benchmark metrics that can indicate the effectiveness or ineffectiveness of a well designed and executed e-learning program. In Part B, a validation activity was performed through the use of a structured interview of individuals from three different organizations. Within each organization, the supervisor (manager or higher) was walked through the entire e-learning program effectiveness framework, shown how it was developed, and exposed to the results from the case organization. A structured interview was conducted with each supervisor independently to determine if he or she perceived that the framework, process, and tools were an effective method for evaluating an e-learning program's effectiveness in any organization.

*PART A: e-LEI Scorecard*

As described above, the three stakeholder groups during the concept-mapping process in Phase I developed 7 major categories of KPC statements that were termed Key Performance Indicators (KPIs): *job performance and improvement, career enhancement, business impact, organizational sponsorship and commitment, curriculum level measures, objective training metrics, and course delivery and usability.*

A paper survey, the e-Learning Effectiveness Index (e-LEI), was developed based on the KPIs as the metric for measuring program effectiveness. A total of 20 surveys were distributed to a random population of e-learning end-users within the company, and the sample group returned (n=16) completed surveys. Of the sample population who returned the surveys, 8 were male and 8 were female. Demographical data were also collected on associates' time on the job in months ( $\underline{M}=21$ ), with the upper limit being 130 months, and the lower limit being 2 months.

Figure 4.6 e-Learning Program Effectiveness Survey Demographics

Source information	Univariate analyses										
	Distribution frequency					Central tendency			Dispersion		
	1	2	3	4	NA	Mean	Median	Mode			Standard deviation
	Male	Female									
Gender	8.0	8.0									
Job function											
Months on the job with the company	9.0	3.0	1.0	1.0	2.0	38.3	21	18	2	130	39.2
Total years in this specific job function at any company	5.0	6.0	1.0	2.0	2.0	9.3	6	6	1	29	8.3
Total years you have been using e-learning with any company	10.0	3.0	1.0	2.0	0.0	2.9	2	2	0.5	8	2.4

The data was collected from the 16 sample group participants, and Univariate statistical analysis was performed. Table 4.2 summarizes the data results. The highest mean KPI group was *quantifying training metrics* ( $\underline{M}=3.3$ ), while the KPI *affecting my job*

*performance* had a mean of 3.2. Three KPIs had the same mean value ( $\underline{M}=2.9$ ): *determining organizational sponsorship and commitment*, *measuring e-learning curriculum* and *appraising course delivery / usability*. This was followed by the KPI *enhancing my career* ( $\underline{M}=2.7$ ) and *impacting our business* ( $\underline{M}=2.8$ ).

*Impacting our business* achieved the overall highest average standard deviation of the KPC statements in each KPI group with a value of  $\sigma =0.8$ , while *enhancing my career*, *measuring e-learning curriculum* and *determining organizational sponsorship and commitment* had the same standard deviation value of  $\sigma =0.7$ . Similarly, the other three KPI groups, *affecting my job performance*, *quantifying training metrics*, and *appraising course delivery / usability*, had the same value for standard deviation ( $\sigma =0.6$ ).

Analysis of distribution frequency results between the seven KPI categories in the survey resulted in the following: Within the *affecting my job performance* KPI group, the *my performance as an associate has improved due to the learning I have acquired* KPC had the highest “agree” frequency between respondents ( $n=12$ ), while *I have acquired new skills and received knowledge faster from our e-learning program* had the highest “somewhat agree” frequency ( $n=8$ ). The KPC *I have learned information relevant to current projects and projects planned for the future* received the highest response for both “somewhat disagree” ( $n=6$ ) and “disagree” ( $n=10$ ). In the *enhancing my career* KPI group, the *I have benefited from this e-learning training* KPC had the highest “agree” frequency ( $n=12$ ), while *my communication skills have improved through the use of our e-learning program* had the highest “somewhat agree” frequency ( $n=7$ ).

Source information	Univariate analysis										
	Distribution frequency					Central tendency			Dispersion		
	1	2	3	4	NA	Mean	Median	Mode			
<b>Affecting my Job Performance</b>	Disagree Frequency	Somewhat Disagree Frequency	Somewhat Agree Frequency	Agree Frequency	NA	3.2	3.3	3.3	2.2	3.7	0.6
My on-the-job performance has improved.	0.0	1.0	5.0	10.0	0.0	3.6	4	4	2	4	0.6
I am able to use the new knowledge from my e-learning training in my job.	0.0	0.0	5.0	11.0	0.0	3.7	4	4	3	4	0.5
My performance as an associate has improved due to the learning I acquired from our e-learning program.	0.0	0.0	4.0	12.0	0.0	3.8	4	4	3	4	0.4
The number of skills I can transfer to my job has increased due to my e-learning training that I have taken.	0.0	1.0	6.0	8.0	1.0	3.5	4	4	2	4	0.6
I have learned information relevant to current projects and projects planned for the future from our e-learning program.	10.0	6.0	0.0	0.0	0.0	1.4	1	1	1	2	0.5
I have acquired new skills and received knowledge faster from our e-learning program.	0.0	1.0	8.0	7.0	0.0	3.4	3	3	2	4	0.6
<b>Enhancing my Career</b>						2.7	3.0	3.0	1.4	3.4	0.7
My e-learning training has assisted my growth and career development.	1.0	1.0	4.0	10.0	0.0	3.4	4	4	1	4	0.9
My e-learning training has supported me in assisting in the strategic business direction of our company.	5.0	8.0	3.0	0.0	0.0	1.9	2	2	1	3	0.7
My communication skills have improved through the use of our e-learning programs.	2.0	5.0	7.0	2.0	0.0	2.6	3	3	1	4	0.9
I have benefited from this training provided by e-learning.	0.0	0.0	4.0	12.0	0.0	3.8	4	4	3	4	0.4
The company's recruiting ability has improved due to our e-learning programs.	5.0	11.0	0.0	0.0	0.0	1.7	2	2	1	2	0.5
<b>Improving our Business</b>						2.6	2.7	2.5	1.3	3.8	0.8
The servicing of my internal customers has improved as an outcome of the e-learning training I have taken.	4.0	3.0	5.0	4.0	0.0	2.6	3	3	1	4	1.2
My core competencies levels for my job performance have improved because of our e-learning program.	0.0	0.0	5.0	11.0	0.0	3.7	4	4	3	4	0.5
Our company's overall organizational performance has improved due to our e-learning programs that I have felt my overall satisfaction and job morale increased due to our e-learning program.	1.0	7.0	6.0	2.0	0.0	2.6	2.5	2	1	4	0.8
Our company's profitability has grown as an outcome of our e-learning program.	2.0	3.0	9.0	2.0	0.0	2.7	3	3	1	4	0.9
Best practices and new technology training has been delivered as required through the use of our e-learning programs.	8.0	5.0	3.0	0.0	0.0	1.7	1.5	1	1	3	0.8
<b>Determining Our Need for Sponsorship and Commitment</b>						2.9	2.9	3.0	1.8	4.0	0.7
Management has encouraged me to take training at work.	4.0	5.0	4.0	3.0	0.0	2.4	2	2	1	4	1.1
Management has been more supportive of my work after taking e-learning training for my job.	5.0	3.0	7.0	1.0	0.0	2.3	2.5	3	1	4	1.0
A learning environment has been fostered at our company.	4.0	7.0	4.0	1.0	0.0	2.1	2	2	1	4	0.9
Learning has been integrated with the performance review process.	0.0	1.0	12.0	2.0	0.0	3.1	3	3	2	4	0.5
Supervisors have been able to observe my learning progress through our e-learning system.	0.0	0.0	6.0	9.0	1.0	3.6	4	4	3	4	0.5
My training records are available for review and management.	0.0	0.0	4.0	12.0	0.0	3.8	4	4	3	4	0.4
<b>Measuring e-Learning Performance</b>						2.9	2.8	2.8	1.8	3.8	0.7
I found course navigation from screen to screen has been easy in the e-learning training.	0.0	0.0	13.0	3.0	0.0	3.2	3	3	3	4	0.4
This e-learning training is "Just-in-time" for my job needs.	0.0	1.0	9.0	6.0	0.0	3.3	3	3	2	4	0.6
This e-learning training has been interesting and has kept my attention.	1.0	6.0	5.0	4.0	0.0	2.8	3	2	1	4	0.9
Access to the e-learning training has been easy.	0.0	0.0	6.0	9.0	0.0	3.6	4	4	3	4	0.5
The modular structure of our e-learning training has allowed each course to build on another.	2.0	8.0	5.0	0.0	1.0	2.2	2	2	1	3	0.7
This e-learning training has accommodated multiple learning styles.	3.0	4.0	5.0	1.0	3.0	2.3	2	3	1	4	0.9

Source Information	Univariate analysis										
	Distribution frequency					Central tendency			Dispersion		
	1	2	3	4	NA	Mean	Median	Mode			
	Disagree Frequency	Somewhat Disagree Frequency	Somewhat Agree Frequency	Agree Frequency	NA	3.2	3.3	3.3	2.2	3.7	0.6
<b>Qualifying Training Metrics:</b>						3.3	3.3	3.2	2.2	4.0	0.6
The e-learning courses contain measurable learning objectives.	0.0	2.0	10.0	4.0	0.0	3.1	3	3	2	4	0.6
My performance has improved from the pre-course to the post-course when I take e-learning training.	0.0	1.0	9.0	6.0	0.0	3.3	3	3	2	4	0.6
My cost for travel associated with training has been reduced.	0.0	0.0	0.0	16.0	0.0	4.0	4	4	4	4	0.0
Time lost from work for training travel has decreased due to our e-learning programs.	1.0	1.0	4.0	10.0	0.0	3.4	4	4	1	4	0.9
My course material costs were less with this e-learning training.	0.0	0.0	2.0	14.0	0.0	3.9	4	4	3	4	0.3
My time required to take new required training has been reduced by having our e-learning program.	6.0	4.0	4.0	2.0	0.0	2.1	2	1	1	4	1.1
<b>Appraising Course Delivery/Usability:</b>						2.9	2.7	2.7	2.0	3.7	0.6
The e-learning program has current business updates incorporated into all training delivered.	13.0	3.0	0.0	0.0	0.0	1.2	1	1	1	2	0.4
The e-learning delivery system performed and was reliable.	0.0	0.0	10.0	6.0	0.0	3.4	3	3	3	4	0.5
My learner's satisfaction level has increased due to our e-learning program.	0.0	5.0	7.0	4.0	0.0	2.9	3	3	2	4	0.8
Our e-learning program provides a broad range of course topics to meet my current learning needs.	0.0	1.0	9.0	6.0	0.0	3.3	3	3	2	4	0.6
My learning tracks have been clearly defined within the	0.0	3.0	7.0	5.0	0.0	3.1	3	3	2	4	0.7
Learning has been fun - an enjoyable work activity.	0.0	1.0	8.0	6.0	0.0	3.3	3	3	2	4	0.6

Figure 4.7 Results of the e-Learning Program Effectiveness Survey

The KPC *the company's recruiting ability has improved due to our e-learning program* received the highest response for “somewhat disagree” (n=11). Next, *the company's recruiting ability has improved due to our e-learning program along with my e-learning training has supported me in assisting in the strategic business direction of the company* both received the same frequency rating of “disagree” (n=5).

In the *impacting our business* KPI group, *my core competency levels for my job performance have improved because of our e-learning program* had the highest “agree” frequency between respondents (n=11), while *I have felt my overall job satisfaction and morale increased due to our e-learning program* had the highest “somewhat agree” frequency (n=9). The KPC *our company's overall organizational performance has improved due to our e-learning program* received the highest response for “somewhat disagree” (n=7). Interestingly, *best practices and new technology training has been delivered as required* received the same frequency rating of “disagree” (n=8). In the KPI group called *determining organizational sponsorship and commitment*, the KPC *my*

*training records are available for review and management* had the highest “agree” frequency between respondents (n=12), while *learning has been integrated with the review process* had the highest “somewhat agree” frequency (n=12). The KPC *a learning environment has been fostered at our company* received the highest number of frequency responses for “somewhat disagree” (n=7). Finally, *management has been more supportive after taking e-learning training* received the same frequency rating of “disagree” (n=5).

In the *measuring e-learning curriculum* KPI group, *access to the e-learning training has been easy* had the highest “agree” frequency between respondents (n=9), while *I found course navigation from screen to screen has been easy in the e-learning* had the highest “somewhat agree” frequency (n=13). The KPC *the modular structure of our e-learning training has allowed each course to build on another* received the highest response frequency for “somewhat disagree” (n=8). Lastly, *this e-learning training has accommodated multiple learning styles* received the frequency rating of 3 for “disagree.”

In the *quantifying training metrics* KPI group, *my cost for travel associated with training has been reduced* had a complete consensus between all respondents with the highest “agree” frequency of 16, while *the e-learning courses contain measurable learning objectives* had the highest “somewhat agree” frequency (n=10). The KPC *my time required to take new required training has been reduced by have e-learning* received the highest response for “somewhat disagree” (n=4) and also for “disagree” (n=6). In the final group of KPIs, three KPC statements had a value of 6 in the “agree” scale: *the e-learning system performed and was reliable, our e-learning program provides a broad range of course topics to meet my current learning needs, and learning has been fun – an*

*enjoyable work activity. The KPC the e-learning system performed and was reliable had the highest “somewhat agree” frequency (n=10), while my learner’s satisfaction level has increased due to our e-learning program received the highest response for “somewhat disagree” (n=5). Finally, the e-learning program has current business updates incorporated into all training received a frequency rating of 13 for “disagree.”*

#### *PART B: e-Learning Supervisor Interviews*

In this final section of Phase III, three separate interviews were conducted with supervisors of e-learning programs in three other corporate organizations. The interviews were conducted to determine if the supervisors within these organizations perceived the usefulness of the e-LEI scorecard in helping their organization measure how effectively their e-learning program was operating. The results of the three interviews were edited and are summarized collectively as follows.

#### **Summary Results of Interviews with Corporate e-learning Supervisors**

##### **1. How many employees does your organization have?**

- i. Hewitt Associates: 20,000 employees worldwide
- ii. Enspire Learning: 62 employees
- iii. Maximize Learning: About 4,000 on three continents

##### **2. How long has your e-Learning program been in existence?**

- i. Approximately 6 years
- ii. A couple of years
- iii. Approximately 3 years

##### **3. Do you use an LMS?**

- i. SumTotal LMS

- ii. We have developed a proprietary system.
- iii. We use the SumTotal system.

**4. Do you use an LCMS?**

- i. Yes, we have a SumTotal LCMS.
- ii. No
- iii. Yes, we have it as part of the SumTotal system but we do not actively use it for managing learning objects.

**5. Approximately how many end-users in your organization use e-learning for their jobs?**

- i. Approximately 50%
- ii. A usage rate of 35%
- iii. A usage rate of 100% but at different participation levels.

**6. How applicable is this tool to your learning environment?**

- i. I feel the organization might be a little uncertain how they are supposed to rate the performance criteria in our environment.
- ii. Overall, the tool would be very helpful, actually in evaluating any training initiative.
- iii. I think the e-LEI scorecard as you call it can be a valuable tool to gain end-user reactions and um...perceptions about our programs.

**7. Does your organization have established performance criteria that are used to measure your e-learning programs effectiveness?**

- i. In terms of measurement, yes, we have it.



- ii. Our managers use assessments and various performance measurement tools to measure employee performance.
- iii. Mostly in the form of pre- and post-survey types of assessments. More of a smile sheet evaluation.
- iv. Yes, performance criteria have been established with stakeholders in our organization.

**8. If YES to question 7, can you explain what the performance criteria are?**

- i. Metrics coming from the Learning Management System (LMS).
- ii. This includes such questions as:
  - Feel more capable at what you do?
  - Discourse on the subject material?
  - Confident now to use on your job?
  - Do you feel you know the subject material?
  - Did it meet your expectations?
- iii. Data is collected through our LMS system and pertains to a large extent on end-user data, such as:
  - number of users per month
  - time working on courses
  - course completions
  - success on knowledge assessments
  - e-learning course satisfaction reviews
  - cost per course to deliver

- We have developed monthly reports so that we can report out to executive management metrics that are meaningful. Really a dashboard of key metrics of interest to our firm.

**9. If YES to question 7, how often is the e-learning program being measured for its overall effectiveness?**

- i. On a quarterly basis.
- ii. The learning managers have developed a measurement and evaluation system that works from the smile sheet data.
- iii. We collect and report out on the data every month and we can create whatever reports we need since we pull the data from a database and use a business intelligence software package to manipulate the data as we require.

**10. Are you presently satisfied with how your e-learning program's effectiveness is measured?**

- i. Needs to be improved and expanded upon.
- ii. No. Simply because the managers have not done a lot of correlation between the actual performance in the training program and what the individual survey revealed.
- iii. They always look for how we can perform the role as learning leaders better. Learning practitioners don't have a really good grasp of the type of information that we really need. e-Learning is still fairly young in terms of being deployed effectively and we are trying to understand this and grow.

## **Section B:**

### **1. How effective do you think the e-LEI scorecard would be in assisting your organization in measuring your e-learning program's effectiveness?**

- i. Could be pretty effective.
- ii. The e-learning effectiveness index is a perception-based instrument so it could be used to collect opinions and attitudes. Should balance that with our sources of data, such as the number of people taking courses, completion rates, and post-training effects. As far as a perception-level evaluation, it is very thorough.
- iii. What I like about your tool is that it measures many different aspects of a program. It is perception-focused, but I value the perceptions of our users. Also, I really like the idea that the survey was developed using managers, end-users, and training developers because I know they view things differently between what is important and what is not. I think we would include this survey as part of other metrics we already collect now.

### **2. Do you think the Key Performance Criteria (KPCs) that were identified by three different stakeholder groups during concept mapping are the right types of criteria to measure against?**

- i. I think so.
- ii. Yes, absolutely! It is one of the more thorough evaluation pieces in terms of a broad range of measurable effects. The stakeholder groups used in this research were right on target.

- iii. The performance criteria should be a part of a comprehensive evaluation system of how effective our e-learning program is running. Combining your survey information with our existing data coming from our LMS can be a powerful way of understanding what is working and what isn't.

**3. In your opinion, were the stated performance indicators in the survey sufficient for building an e-learning scorecard?**

	Yes	No	Both
➤ Job Performance	3		
➤ Career Enhancement	3		
➤ Business Impact	3		
➤ Organizational Sponsorship	3		
➤ Curriculum Adequacy	2		1
➤ Training Metrics	2	1	
➤ Course Delivery/Usability	3		

Note: Number by Yes or No indicates the response made by the 3 e-learning supervisors.

**4. Did the survey data provide the feedback required to target problems with the e-learning in terms of?**

	Yes	No	Both
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➤ Meeting Business Objectives	3	
➤ Program Effectiveness	3	
➤ Transfer of New Knowledge		3
➤ Practice of New Skills	1	2
➤ Performance of Goals	3	
➤ Up-to-Date Courseware	3	

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**5. Would the sample survey result data be able to indicate any improvements that are required to an e-learning program?**

- i.* The data would be useful based on how a person perceives things. You could match this up with actual performance data and this could be very, very beneficial! It gives you a sense of an organizational perspective when you look at the numbers in aggregate. Obviously, there is a lot of other data that would go along with this. To be able to use actual performance data in conjunction with these types of surveys provides good insight, such as what one needs to devote attention to. It provides you with a dashboard to get “indications” of areas that are being perceived as successful and areas that are being perceived as not being successful. It puts you in a position to peel the onion back and really find out more information of where the problem might be. It provides you with something to measure against and something to set targets against.

- ii.* I would particularly agree in measuring the e-learning delivery and usability. Also, really good data from “impact of business” (KPI) in terms of understanding cost issues and what ROI would be coming out of that.
- iii.* Perception is reality. If the survey has been administered properly and you get enough feedback from a sample group, then I believe that these responses are good “indicators” of how employees feel the e-learning program is being delivered. The scorecard is critical to inform management what is perceived by the population, to what is working or not working well. If our training team knows at a high level what is not working, we can perform additional investigation with the concerned parties to find out the root cause of the perceived problem. After this investigation, we would then we would be in a better position to adjust and make corrections.

**6. Do you have any comments or suggestions for improvement of the e-Learning Program Effectiveness process, tools, and scorecard?**

- i.* Maybe looking at organizational factors and modifying the e-Learning Effectiveness Index based on that organization’s culture. The e-LEI survey does get to some of the points that are important in managing the e-learning side of an organization’s training department.
- ii.* First, I think it is a fabulous methodology that is credible. This makes me look at the tool seriously. You would want to integrate the tool with LMS data as well. Also, you should use more visual indicators in your

scorecard that a manager could print out and say “ya, look at this!” Also, allow the e-learning manager to add one question of his or her own such as a specific business objective or other KPC that he or she might want to measure.

- iii. You definitely got the process right in linking e-learning performance results to business goals. Also, how you went about collecting different perspectives from different groups like managers and trainers is a good approach. Where I think you could further improve the tool is in the survey itself. The wording that is used in your criteria could be refined further and I think that will occur as the survey tool is deployed more and you get feedback on this. Also, you might include a part of the survey that would allow for the respondent to be able to give feedback on something that is not included in the tool but that he or she feels is important to speak about. I not sure how you could do this but if you could put weights to each performance criteria and even monetary values of some sort, then this could be a powerful tool as part of measuring the e-learning program and its delivery effectiveness.

In summary, the three e-learning supervisors from different organizations all agreed that both the process of determining the key performance criteria for e-learning program measurement purposes and the actual results of the e-LEI scorecard from the study were an important contribution to understanding if an e-learning program is perceived to be effective within the organization. The three e-learning managers also agreed that additional metrics should be included in the e-LEI scorecard that could come

from, for example, a corporate learning management system and corporate revenue results. These possible improvements to the scorecard are discussed in more detail in Chapter 5.



## CHAPTER 5

### DISCUSSION

#### Phase I

The research performed in Phase I was designed to answer the first hypothesis by determining if different stakeholder groups within an organization, such as managers, end-users, and performance designers, have different opinions as to what could be used as metrics, here called key performance criteria (KPCs), in evaluating e-learning program effectiveness. Also, it was intended to see if the different stakeholders perceived the KPCs differently in terms of their relative importance in contributing to the accurate measurement of an effective organizational e-learning program. This first phase of the study produced evidence of perceptual variation among stakeholder groups regarding key performance indicators (KPIs) that could be used to measure e-learning program effectiveness. The most important KPIs identified in the concept-mapping activity were *business impact* and *job performance and improvement*, which relate well to performance criteria that measure the contribution of e-learning programs to the overall business. The second most important KPI, *business impact*, highlights what an e-learning program contributes to employee development (talent management) and the overall growth of the organization through enhanced learning.

In analyzing the inter-group pattern matching, it is interesting to note that both managers and e-learning end-users perceived the importance of the KPI *job performance and improvement* as the most important KPI in evaluating the overall effectiveness of an e-learning program. Similarly, they both ranked *curriculum level measures* as least important. Performance designers *also ranked curriculum level measures* as being least

important as a KPI in measuring an e-learning program's effectiveness. *Curriculum level measures* tend to be metrics that can easily come from a Learning Management System (LMS) used to deploy an e-learning curriculum. Many research articles have recently examined and promoted these types of metrics for evaluation purposes, but these measures were shown to be least important to the three stakeholder groups in this study. What is also notable is that the performance designer group ranked the importance of KPIs related to training metrics such as *objective training metrics, course delivery and usability*, and *curriculum level measures* as having a low level of importance as KPCs. One would expect that this stakeholder group would be most interested in these KPIs in their design and development of effective e-learning curriculum for their constituents.

#### *Phase I Limitations*

Several limitations in Phase I should be noted. These limitations involve primarily reliability and validity issues associated with the concept-mapping process and methodology used. The first issue is related to a lack of similar empirical studies in e-learning program evaluation for comparison purposes. The concept-mapping process typically involves at least 15 or so participants to brainstorm, sort, rank, rate, and interpret a single concept map (Trochim, 1985). There have been numerous published research projects that describe concept-mapping projects as a single group facilitated activity (Michalski, 1997; Trochim, 1999). However, studies similar to the research approach have been few and limited (Trochim, 1997). This study included 36 participants separated into three groups consisting of managers, end-users, and performance designers who were involved in the creation of the concept maps. Rather than spending time debating the technical challenges involved with comparing the three different concept

maps, this research combined responses into a single concept map. While this approach did permit the calculation of pattern matches, it lost the emphasis on the individual concept maps. It would be interesting to investigate each concept map individually from the three different stakeholder groups as independent research projects. This would, however, be a qualitative comparison and would not present the opportunity to calculate pattern-matching coefficients between the three sample groups.

Within Phase I, a second limitation concerns the sample representativeness and generalizability of the results. This study was a single case study focused on one organization, and the sample groups were from only one department (Information Technology) in the company. Additionally, the manager sample group was small compared to the other two sample groups. Due to this situation, the results obtained in this phase cannot be generalized confidently to the entire case organization.

The final limitation in this phase is the reliability of the concept-mapping procedure itself. Trochim (1993) argued that the traditional theory of reliability that applies in social science research does not fit the concept-mapping model very well because the theory advocates that for each test item, there be a correct answer, hence, an *a priori* situation. In traditional models of research, reliability assessment focuses on the test questions and/or total scores within the test so that reliability can be effectively calculated. However, Trochim stated that concept mapping has a different emphasis entirely. In concept mapping, there are no correct or incorrect answers. Rather, it is assumed that the statements can be normatively arranged as reflected in the sorting procedure by all sample members, who come from a relatively homogeneous group. The emphasis in the reliability determination moves from the individual item to the actual

research participant. Now the reliability assessment is focused on the consistency across all of the participants. This shifts the discussion towards the reliability of the concept maps and not the participants' individual statements created as the KPCs in this investigation.

## Phase II

The research performed in Phase II set out to answer the second hypothesis by determining whether stakeholders can assess and rank the importance of each KPC that was identified in the concept-mapping evaluation into Gilbert's (1996) Performance Requirements model and if they are able to validate that their KPCs meet Gilbert's performance requirement standards. Gilbert's performance criterion Quality achieved the highest group mean (4.39), Cost had a mean of (4.30), while Quantity was the lowest at 3.63. The three stakeholder groups who completed the survey were able to place all of the KPCs into one of Gilbert's three primary performance categories and into one of his nine performance sub-categories. Therefore, all of the KPCs identified during the concept-mapping process in Phase I by the three stakeholder groups met Gilbert's performance criteria categorization requirements.

### *Phase II Limitations*

During Phase II, the predominant limitation to this phase was stakeholder interpretation of terminology. Each of Gilbert's three primary performance criteria categories is largely dependent upon the participant's interpretation of the meaning of the terms *quality*, *quantity*, and *cost* as they relate to the KPCs. Within any organization, employees have a different understanding and viewpoint of the quality, quantity, and cost of all of their business parts. Taking the KPCs and placing each one into Gilbert's

performance categories is largely personal and judgmental in nature, and it relies solely on the discretion of the participant. Perhaps improved definitions of all three of Gilbert's performance categories as well as the sub-categories would reduce personal interpretation of the KPCs and how they fit into Gilbert's model.

### Phase III

The research performed in Phase III was designed to answer the third hypothesis by determining if KPIs, when integrated into Gilbert's Performance Requirements model, could be used as benchmark metrics to develop an e-LEI scorecard. Such a scorecard could provide a framework that represents measurable on-going benchmark metrics for measuring the effectiveness or ineffectiveness of an e-learning program. In this study, it is evident that the end-users participating in the e-Learning Program Effectiveness survey believed that they were not getting organizational or supervisor support in their learning to improve on-the-job performance. Conversely, they perceived that the overall e-learning program was effective in meeting their training needs and that it did improve their on-the-job performance.

In Part B of Phase III, e-learning supervisors were interviewed in an effort to determine the usefulness of the e-LEI as it related to providing decision-making information based on end-users' perceptions of the overall program. The three supervisors who participated were in agreement that the e-LEI scorecard is an excellent procedure for better understanding how their e-learning programs are doing, but all three supervisors agreed that there could be additional supporting metrics from an LMS and internal business performance metrics such as financial results and company growth.

### *Phase III Limitations*

In Part A of this study in Phase III, the e-Learning Program Effectiveness survey was administered only to the case organization in a single event and the data was captured and analyzed with responses from 18 end-users. Although the data would provide any e-learning program supervisor with identified areas for improvement and would show what is working or not working well in his or her program, it would not provide any type of trending data. This type of trend information would require three or four survey deployments and corresponding data capture and analysis to indicate if an e-learning program and specifically the KPIs were creating trends. Based on this survey data and its inclusion into the e-LEI scorecard, the supervisor would be in a better position to make decisions on how he or she would like the performance technology designers to investigate and improve on the KPIs that were indicating problem areas. This ability to “peel the onion back” based upon real end-user data is at the heart of this research and the e-learning program effectiveness evaluation framework that is proposed in this study.

In Part B of Phase III, interviews were performed with three outside organizations and their e-learning program supervisors through a structured interview process. The data sample collected was based on those supervisors who voluntarily participated in the interview with the researcher. The study didn't collect extensive data on demographic information other than gender, size of company, and years of deploying e-learning programs. Furthermore, the researcher had a significant background in the field of inquiry, e-learning, which may have introduced an unintentional bias. Such biases when organizing and categorizing responses can influence the data analysis. Interview

reliability was also compromised through the use of open-ended questions during the interviews rather than fixed choice alternatives, and interviewees might have interpreted the questions differently. Hence, a structured reproduction of the interviews may not replicate similar results within the study.

### Recommendations for Future Research

This research study highlighted the need for continued exploration and investigation into evaluating e-learning program effectiveness beyond the application of Kirkpatrick's four levels of learning evaluation. The first recommendation for future research would be to examine several organizations instead of just a single case organization in performing the concept mapping activities and determining KPCs as metrics against which to measure an e-learning program's effectiveness. A comparison of differences and similarities between stakeholder groups and organizations through pattern matching could be valuable.

The second recommendation would be to deploy the e-Learning Program Effectiveness survey over an extended period of time to different organizational stakeholders and different organizations. Determining trends based upon the KPIs could offer interesting insights into how different organizational e-learning programs are being perceived in terms of effectiveness by their internal stakeholders.

Finally, the third recommendation would be to expand and understand other KPIs within an organization that could contribute to a more complete understanding of an e-learning program's effectiveness. The identification and understanding of possible performance criteria identified in concept mapping is a very good start in measuring an e-learning program's effectiveness. However, the data collected from the e-learning

program effectiveness survey in Phase III was based upon end-users' reactions and impressions of how well the e-learning program within the organization was operating and provided the program's leadership with a tool to base decisions upon to make improvements. Consideration should be given to other data that might be integrated into the scorecard. An example would be the data that is collected from an LMS, such as usage, courses developed and deployed, certification rates, etc. Additional data could be captured within the training department itself such as increase or decrease in spending, production time, and quality improvement costs. All of this scorecard data should then be integrated on a broader basis into Kaplan and Norton's Balanced Scorecard model, which incorporates other metrics into the on-going measurement of an organization's effectiveness.

One last note should be said about measuring e-learning program's effectiveness. Additional research should be pursued to determine best design, development and implementation practices for e-learning program effectiveness. I believe we have just begun to uncover the tip of the iceberg of what metrics we should establish as benchmarks for measuring an e-learning program's effectiveness. Continued research should investigate what organizations are presently using as the performance criteria that they measure their programs against and how to best go about capturing the data so they can analyze it and continually improve their programs and evaluation methodology.

### Conclusions

The rapid integration of e-learning into an overall blended learning approach within organizations is still in its infancy but growing rapidly. This raises basic questions about e-learning program effectiveness and best practices being applied today so that



organizational leaders can make better decisions on improving or modifying their e-learning programs to meet the needs of their employees. This research study was an investigation into developing a framework and effective tools that could be used for measuring a stand-alone e-learning program's effectiveness.

The first question in the research was to determine what KPCs extracted from different corporate stakeholders could contribute to developing benchmarks that could be used to measure the effectiveness of an e-learning program within an organization. Concept-mapping and pattern-matching procedures for program evaluation purposes have been used in previous research (Linton, 1986; Michalski, 2000; Trochim, 1989). Within the context of this study, concept mapping produced three separate statement groups of KPCs as perceived by the three stakeholder groups that could be used as benchmarks to measure e-learning program effectiveness. Trochim's concept-mapping process (1989) and his Concept Systems (2001) software application were used in performing cluster analyses of all KPCs and in grouping the KPCs into seven major clusters, called KPIs (Petersen, 2007). Therefore, Trochim's concept-mapping process proved to be an effective method to identify, collect, and organize different organizational stakeholders' perceptions that could be used as benchmarks for e-learning program evaluation.

The use of concept-mapping techniques was again applied in this research in determining to what extent stakeholder groups differ in their perception about the key performance criteria and their importance in evaluating e-learning programs. Within this research, three separate KPC statement groups were collected from the organizational managers who fund the e-learning programs, performance designers who create content for the e-learning programs, and end-users who participate in the e-learning trainings. By

utilizing Trochim's (1989) pattern-analysis techniques between stakeholder groups, the research demonstrated that the three stakeholder groups varied in their perceptions about the importance of each KPI cluster group when compared with other groups. Interestingly, the managers and end-users of e-learning programs had the highest consensus and correlation ( $r = .89$ ) between the seven KPIs. Both stakeholder groups perceived the KPI group, Job Performance and Improvement, to be the most important in evaluating e-learning program effectiveness; at the same time, end-users saw the KPI, Business Impact, as second most important while managers had this rated the fourth most important KPI. One would have perhaps thought that the results would be reversed as managers who pay for their employees to take the e-learning training are expecting a learning activity to contribute to on-the-job improvement and to impact business results (Michalski, 2000). The performance-designer stakeholder group also saw the KPI, Business Impact, as the most important group of all so they were in agreement with the end-user group when it came to this KPI as an important indice. All three groups perceived the KPIs of Course Delivery and Curriculum Measures as the least important of the KPIs when used as a benchmark metric in measuring e-learning program effectiveness. This could be because all three stakeholder groups feel that the KPCs within those KPI groups are not as important as KPIs that contribute to the success of the business (Business Impact), to improving the way they perform on the job (Job Performance and Improvement), and to the support they get from corporate executives (Organizational Sponsorship) in pursuing learning opportunities.

Developing an e-learning program effectiveness scorecard that could provide e-learning program supervisors with a framework and tool to measure KPIs for on-going

decision-making was a goal of this research. The third and final question in the research was to investigate how KPIs could be integrated into an evaluation process that would contribute to an e-LEI scorecard. In the third phase of the research, the seven groups of KPIs were successfully used in creating benchmark questions formatted into an electronic survey and used in collecting the perceptions of e-learning program end-users within a single organization as to how well their e-learning programs were working. The results from the end-user survey data were successfully used to create an e-LEI scorecard. In validating the e-LEI framework and tool with other organizational e-learning supervisors, the results from structured interviews indicated that all three e-learning program supervisors agreed and supported the e-LEI framework and tools as an effective method to gather end-users' perceptions on e-learning program effectiveness. However, two of three e-learning supervisors indicated that the e-LEI framework should also include other benchmark metrics that could be gathered from other areas within the learning organization such as through a Learning Management System. The LMS could provide metrics such as number of employees who took some form of e-learning in a given period, number of completions, number of passes with assessment tests offered, number of certifications, cost of e-learning course delivery versus other delivery methods, etc.

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## APPENDIX A

### DATA COLLECTION FROM CONCEPT MAPPING AND PATTERN MATCHING

**Concept Mapping: Key Performance Criteria Capture  
Group: 1 – End-Users (Associates)**

<b>1</b>	Improved percentage of transference of skills learned to the job.
<b>2</b>	Satisfactory performance of learning requirements for the job.
<b>3</b>	Increase in use of e-Learning.
<b>4</b>	Improved usability of the new knowledge to the job.
<b>5</b>	Improved assessment scores.
<b>6</b>	Improved learning conditions.
<b>7</b>	Increased performs improvement on the job per eight-hour day based on increased knowledge.
<b>8</b>	Increased number of course completions.
<b>9</b>	Increased number of registrations.
<b>10</b>	Reduced turnover.
<b>11</b>	Associate satisfaction measurement (relating to e-Learning).
<b>12</b>	Increased confidence in associate performance.
<b>13</b>	Better learning objectives to improve learner understanding
<b>14</b>	Improves or assists growth and career development in associates.
<b>15</b>	Determines management buy-in (evidenced by end users taking the class.)
<b>16</b>	Increased ROI
<b>17</b>	Improves reusability of learning materials for review.
<b>18</b>	Improve morale.
<b>19</b>	Becomes ingrained in culture of company.
<b>20</b>	Improve on-the-job customer service.
<b>21</b>	Can measure assessment scores and can set criteria for measurement.
<b>22</b>	Reduces time to competency.
<b>23</b>	Number of hits to a catalog online.
<b>24</b>	Ease of availability.
<b>25</b>	Ease of accessibility.
<b>26</b>	Ease of access to topics.
<b>27</b>	Easy navigation.
<b>28</b>	Required completion vs. optional completions.
<b>29</b>	Reduces the number of calls to the help desk.
<b>30</b>	Associates enjoy learning experience.
<b>31</b>	Perceived as benefit by associates.
<b>32</b>	Internal customer requests for additional courses (demand.)
<b>33</b>	End users use simulations as practice/ reference tool for learning on the job.
<b>34</b>	Paced to accommodate most learning types.
<b>35</b>	Low abandonment rate.
<b>36</b>	LMS system up time.
<b>37</b>	Improves work groups effectiveness.
<b>38</b>	A good program assists in the approval of next year's training budget.
<b>39</b>	Increased word of mouth recommendations by associates.
<b>40</b>	Easily accessible outside of work.
<b>41</b>	Improves associates motivation to do after-hours training.
<b>42</b>	Reduces the time frames to completion.
<b>43</b>	Internal promotion rate increases (career pathing).

<b>44</b>	Courses are short in duration.
<b>45</b>	Courses are easily taken in a short amount of time.
<b>46</b>	E-Learning becomes tool to recruit better talent to the organization.
<b>47</b>	Courses keep learner's attention.
<b>48</b>	Promotes continuous learning environment.
<b>49</b>	Improves (associate) performance in the stores.
<b>50</b>	Contributes to Improving profitability in stores.
<b>51</b>	Improved customer service in stores.
<b>52</b>	Increased sales.
<b>53</b>	Pride in company and brand name.
<b>54</b>	Pre- and Post- performance improvement (e.g. cashier performance).
<b>55</b>	Measurable learning objectives and good learning foundation.
<b>56</b>	Input of stakeholders in design.
<b>57</b>	Input of stakeholders in design configuration and pilot.
<b>58</b>	Comparison of our product line with that of our peer group (benchmarking).
<b>59</b>	Provides good testing on-line.
<b>60</b>	Test scores improved.
<b>61</b>	Availability of courses for all levels of learners.
<b>62</b>	Navigability.
<b>63</b>	Presentation of visual/auditory e-Learning environment.
<b>64</b>	Provides many learning approaches.
<b>65</b>	Provides visual maps for learning.
<b>66</b>	Improved leadership annual assessment scores from year-to-year as a company with e-Learning.
<b>67</b>	Reduced reported HR issues (civil treatment, diversity)
<b>68</b>	Associates are able to complete course outline of their learning (learning path related to job code.)
<b>69</b>	Improved manufacturing and warehouse performance.
<b>70</b>	Increased number of people on development plans.
<b>71</b>	Empowerment (associates have voice.)
<b>72</b>	Measure how people feel after e-Learning.
<b>73</b>	Open avenues of feedback.
<b>74</b>	Response to post-training surveys.
<b>75</b>	Learner's suggestions are actively solicited and acted upon.
<b>76</b>	Reduction of lawsuits.
<b>77</b>	Ownership through input to increase usability.
<b>78</b>	Increase effective team environment.
<b>79</b>	Reduction of number of people with below-average performance.
<b>80</b>	Increased incentive pay for associates.
<b>81</b>	E-Learning used as an incentive.
<b>82</b>	Improved reading skills.
<b>83</b>	Ease of course.
<b>84</b>	Make course as easy as possible.
<b>85</b>	Do some work.
<b>86</b>	Course practices applicable to job performance.
<b>87</b>	e-Learning would encourage associates to participate who wouldn't normally participate.
<b>88</b>	Improved computer usage and skills.
<b>89</b>	Need to become computer literate (capable of using computer.)
<b>90</b>	Associates are able to unlearn, learn and relearn.
<b>91</b>	Exposing individuals to computers who wouldn't normally be exposed.
<b>92</b>	Improved lives in the age of technology.

<b>93</b>	Avoid information overload.
<b>94</b>	Improved upward mobility (bagger to CEO).
<b>95</b>	Executive participation and interest.
<b>96</b>	All levels become interested in participating.
<b>97</b>	Reduced travel time to training.
<b>98</b>	Cost savings for time employees can stay at work.
<b>99</b>	Foster environment in which management allows associates to train at work.
<b>100</b>	Provides rewards for completion of courses.
<b>101</b>	More tools for facilitators.
<b>102</b>	Tools easily availability.
<b>103</b>	Ease of course development and maintenance.
<b>104</b>	Reduces costs on course materials.
<b>105</b>	Increased job aids and tools to learn.
<b>105</b>	Provides learners with more learning tools.
<b>107</b>	Increases just-in-time learning.
<b>108</b>	Bridge the gaps.
<b>109</b>	Improves morale to increase revenue.

### Concept Mapping: Key Performance Criteria Capture

#### Group: 2 – Performance Designers

<b>1</b>	Improves registration for courses.
<b>2</b>	Ability to take training in manageable chunks.
<b>3</b>	Take courses on personal schedule.
<b>4</b>	Improves the teaching of WD standards.
<b>5</b>	Increases certifications opportunities.
<b>6</b>	Increases retention of WD's core competencies.
<b>7</b>	Improves the corporate mission statement and job standards.
<b>8</b>	Courses should be gradable.
<b>9</b>	Interactive and provides right answers.
<b>10</b>	Is just-in-time.
<b>11</b>	Expertise to provide answers to questions.
<b>12</b>	Interruptible.
<b>13</b>	Hands-on interactivity.
<b>14</b>	Provides access to published literature pertaining to topics.
<b>15</b>	Reduces costs.
<b>16</b>	Easy navigation.
<b>17</b>	Improves sign up for courses.
<b>18</b>	Provides content that shows best practices about new technology.
<b>19</b>	Provides effective live testing in a controlled test environment.
<b>20</b>	WD-specific methods being taught.
<b>21</b>	Provides summary recap with walk-aways and job aids.
<b>22</b>	Measures if objectives and expectations were met?
<b>23</b>	Provides opportunities to tell me, show me, and let me try.
<b>24</b>	e-Learning reduces time and improves associate quality of daily job responsibilities.
<b>25</b>	Reduces in travel expenses.
<b>26</b>	Courses are scalable upon one another.
<b>27</b>	Teaches more than tech. Courses (i.e. specific WD business courses.)
<b>28</b>	Re-startable.
<b>29</b>	Accessible.

<b>30</b>	Training beyond job responsibilities (change in job due to promotion.)
<b>31</b>	History of training available (course management).
<b>32</b>	Provides a detailed syllabus.
<b>33</b>	Provides an explanation of prerequisites.
<b>34</b>	Provides clearly defined learning tracks.
<b>35</b>	Improves in morale.
<b>36</b>	Provides multi-faceted testing (authentic assessment).
<b>37</b>	Provides user feedback.
<b>38</b>	Increases statistical analysis (associate scores compared with national standards.)
<b>39</b>	Improves market share
<b>40</b>	Allows recognition of achievement.
<b>41</b>	Provides opportunity to review courses previously taken.
<b>42</b>	Provides chat/bulletin board to discuss (collaboration between associates.)
<b>43</b>	Increases time to complete courses.
<b>44</b>	Training related/incorporated to projects (integrated with project planning.)
<b>45</b>	Is Fun!
<b>46</b>	Contains corporate and/or departmental branding.
<b>47</b>	Appropriate classes pertaining to developing skills to enhance on-the-job performance.
<b>48</b>	Provides prioritization of the courses.
<b>49</b>	Provides new hire WD IT curriculum integration into organization.
<b>50</b>	Allows testing of new hires to determine level of courses needed.
<b>51</b>	Provides placement testing.
<b>52</b>	Clearly defined expectations from management regarding utilization of learning suite.
<b>53</b>	Improved scores in various areas.
<b>54</b>	WD gift certificates for achievement.
<b>55</b>	Provides scorecarding customer satisfaction.
<b>56</b>	Improved customer satisfaction.
<b>57</b>	Volume of training measured against satisfaction of end user.
<b>58</b>	Ease of use.
<b>59</b>	Customer constructive criticism (detailed/interactive feedback.)
<b>60</b>	Ability to retake courses.
<b>61</b>	Availability of training 24-7.
<b>62</b>	Updatability (Ability to customize and update as required with effective dated logic.)
<b>63</b>	Cost effective updates to courses.
<b>64</b>	Ability to get measurements on systems (report ability.)
<b>65</b>	Industry-specific coursework (Availability of courses related to our specific business.)
<b>66</b>	Hands on exercises.
<b>67</b>	Ease of training, use of application.
<b>68</b>	Standards between courses and tests, etc.
<b>69</b>	Standard user interfaces.
<b>70</b>	Cross application availability.
<b>71</b>	LDAP compliant (single sign-on.)
<b>72</b>	Availability of access from off site.
<b>73</b>	Venue flexibility (removable media, CBT based)
<b>74</b>	Reliability of system.
<b>75</b>	Reduced liability from test validity from design perspective.
<b>76</b>	Reduced liability from repercussions from test results; proof of training.
<b>77</b>	Mentoring activity as a follow up to e-Learning.
<b>78</b>	Recognized SME's
<b>79</b>	Global recognition.
<b>80</b>	College credits.

<b>81</b>	Coursework planned with management.
<b>82</b>	Integrated with performance reviews.
<b>83</b>	Don't discontinue other learning programs.
<b>84</b>	Availability of books.
<b>85</b>	Availability of electronic reference library.
<b>86</b>	Advanced degree program.

**Concept Mapping. Key Performance Criteria Capture  
Group: 3 – Managers**

<b>1</b>	Improves performance evaluation
<b>2</b>	Provides a satisfaction survey
<b>3</b>	Provides testing capabilities
<b>4</b>	Improves knowledge retention
<b>5</b>	Relevance to current position
<b>6</b>	Increases associates Immediate demonstration of new skill
<b>7</b>	Increases associate's participation
<b>8</b>	Ease of use
<b>9</b>	Reduces cost per student
<b>10</b>	Improves cost of budget for training
<b>11</b>	Allows measurement to determine if we smarter
<b>12</b>	Improves performance improvement in overall organization
<b>13</b>	Permits supervisory observance
<b>14</b>	Improves level of performance in following course
<b>15</b>	Improves the speed at which we do work
<b>16</b>	Improves hours spent in training and cost to total IS budget
<b>17</b>	Improves our learning environment
<b>18</b>	Reduces the frequency of remedial training
<b>19</b>	Increases the relevance to career progression
<b>20</b>	Increases the matching to the corporate strategic direction
<b>21</b>	Utilizes real life examples for testing purposes
<b>22</b>	Reduces help desk call volume
<b>23</b>	Ability to apply what was learned
<b>24</b>	Measurement of knowledge gained and applied
<b>25</b>	Increases Integration of learning into associate review process
<b>26</b>	Improves company reputation
<b>27</b>	Provides career path changes
<b>28</b>	Is effective as a recruiting tool
<b>29</b>	Increases senior management commitment
<b>30</b>	Improves quality
<b>31</b>	Reduces outside training costs
<b>32</b>	Increases customer satisfaction
<b>33</b>	Increases the availability of courses
<b>34</b>	Breadth of course subjects
<b>35</b>	Improves company's ability to meet milestones
<b>36</b>	Provides mentoring opportunities
<b>37</b>	Improves technical skills and leadership skills
<b>38</b>	Improves performance in relation to topics learned
<b>39</b>	Increases retention by being a retention tool
<b>40</b>	Allows scorecarding
<b>41</b>	Improves voluntary participation by WD associates

<b>42</b>	Improves the number of courses taken per individual
<b>43</b>	Improves the number of associates able to move between job classifications
<b>44</b>	Reduces shrink (quality)
<b>45</b>	Reduces time spent during working hours vs. off hours
<b>46</b>	Measure how often it's being used (hits)
<b>47</b>	Increased sales
<b>48</b>	Increased profits
<b>49</b>	Improved perception of organization by our customers
<b>50</b>	Improved morale
<b>51</b>	Increases vendor recognition
<b>52</b>	Provides recruitment through testing
<b>53</b>	Improved efficiency
<b>54</b>	Voluntary versus required course participation (review)
<b>55</b>	Assist in increasing revenue per associate
<b>56</b>	Improves inventory reduction
<b>57</b>	Measures the time taking the course
<b>58</b>	Demonstrated/applied knowledge of a task by testing in simulated situations
<b>59</b>	Increases course availability and updating of courses
<b>60</b>	Reduction in complexity of our systems.
<b>61</b>	Better communication amongst associates
<b>62</b>	Provides spouse to take courses

## e-Learning Concept Mapping Results

Statement	Rating	
8	Improved job performance	4.82
3	Usability of new knowledge on the job	4.64
30	Improves associate performance	4.64
71	Course content currency (courses up-to-date)	4.59
1	Percentage of skills transferred to the job	4.45
72	Delivery system performance and reliability	4.45
12	Improved customer service	4.41
7	Level of learner satisfaction	4.36
9	Aids or assists growth and career development	4.36
55	Improves WD's core competencies	4.32
85	Supports strategic direction of business	4.32
49	Fosters an environment in which management encourages associates to train at work	4.27
10	Degree of management support	4.23
80	Improves organizational performance	4.23
11	Improved associate satisfaction and morale	4.18
35	Presence of measurable learning objectives	4.18
66	Relevance to current or planned projects	4.18
87	Breadth of course subjects available (e.g., technology, business, leadership, etc.)	4.18
17	Ease of course navigation	4.14
52	Provides "just-in-time" learning	4.14
82	Improves speed of acquiring new knowledge and skill	4.14
83	Fosters a learning environment	4.14
64	Learning tracks are clearly defined	4.09
78	Provides opportunities for immediate skill demonstration	4.09
34	Pre-Post course performance improvement	4.05
89	Improved learning efficiency	4.05
91	Improves communications	4.05
28	Courses keep learner's attention	4.00
16	Ease of course accessibility	3.95
27	Improves talent recruitment and retention	3.95
31	Improves profitability	3.95
58	Delivers best practices and new technology	3.95
67	Learning is fun!	3.95
48	Reduced training travel cost	3.91
59	Teaches WD-specific methods	3.91
76	Learning is integrated with performance reviews process	3.91
79	Increases organizational intelligence (Are we smarter?)	3.91
29	Promotes continuous learning	3.86
68	New hire (new associate) course availability	3.82
69	Improved scorecards in various areas	3.82
21	Improved work group effectiveness	3.77
41	e-Learning is perceived as an associate benefit	3.77
61	Modularized courses build upon each other	3.77
63	Presence of detailed syllabus and prerequisites for all courses	3.77
70	Availability of training 24-7, year-round	3.77
86	Improves company reputation for recruiting	3.77
88	Improves ability to meet project milestones	3.77
15	Ease of course availability	3.73
19	Accommodation of multiple learning styles	3.73
32	Increased sales	3.73
36	Course availability for all levels of learners	3.73
40	Reduces associate percentage with below-average performance	3.73

Page 1

## e-Learning Concept Mapping Results

<b>Job Performance &amp; Improvement</b>		<b>Average Rating:</b>	<b>3.97</b>
6	Improved job performance	4.62	
3	Usability of new knowledge on the job	4.64	
30	Improves associate performance	4.64	
1	Percentage of skills transferred to the job	4.45	
86	Relevance to current or planned projects	4.18	
62	Improves speed of acquiring new knowledge and skill	4.14	
78	Provides opportunities for immediate skill demonstration	4.09	
69	Improved learning efficiency	4.05	
59	Teaches WD-specific methods	3.91	
21	Improved work group effectiveness	3.77	
40	Reduces associate percentage with below-average performance	3.73	
44	Improved computer usage and skills	3.68	
65	Increased associate collaboration	3.65	
45	Improved ability to unlearn and relearn	3.41	
42	Improved associate reading skills	3.23	
53	Teaches WD programming standards	3.23	

<b>Career Enhancement</b>		<b>Average Rating:</b>	<b>3.91</b>
9	Aids to assists growth and career development	4.35	
85	Supports strategic direction of business	4.32	
91	Improves communications	4.05	
41	e-Learning is perceived as an associate benefit	3.77	
86	Improves company reputation for recruiting	3.77	
37	Promotes associate empowerment	3.18	
90	Reduces complexity of our systems	3.18	

<b>Business Impact</b>		<b>Average Rating:</b>	<b>3.92</b>
12	Improved customer service	4.41	
55	Improves WD's core competencies	4.32	
60	Improves organizational performance	4.23	
11	Improved associate satisfaction and morale	4.18	
27	Improves talent recruitment and retention	3.95	
31	Improves profitability	3.95	
58	Delivers best practices and new technology	3.95	
79	Increases organizational intelligence (Are we smarter?)	3.91	
69	Improved scorecards in various areas	3.82	
68	Improves ability to meet project milestones	3.77	
32	Increased sales	3.73	
33	Improves company pride and brand name	3.65	
25	Increased rate of internal promotion	3.14	

<b>Organizational Sponsorship/Commitment</b>		<b>Average Rating:</b>	<b>3.82</b>
49	Fosters an environment in which management encourages associates to train at work	4.27	
10	Degree of management support	4.23	
63	Fosters a learning environment	4.14	
76	Learning is integrated with performance reviews process	3.91	
61	Enables supervisory observance of learner progress	3.73	
62	e-Learner records easily available for review and self-management	3.64	
50	Rewards and incentives for successful course completion	3.55	
75	Improves coursework planning with management	3.55	
74	Accredited courses (e.g., college credits, CEUs, degree program, advanced degree prog)	3.35	

<b>Curriculum Level Measures</b>		<b>Average Rating:</b>	<b>3.27</b>
17	Ease of course navigation	4.14	
52	Provides "just-in-time" learning	4.14	
28	Courses keep learner's attention	4.00	
16	Ease of course accessibility	3.95	
61	Modularized courses build upon each other	3.77	
15	Ease of course availability	3.73	
19	Accommodation of multiple learning styles	3.73	
60	Provides summary recap, "walkaways", job aids	3.68	
56	Level of interactivity and feedback	3.50	
2	Increased use of e-Learning	3.27	
20	Low course abandonment rate	3.09	
22	Positive informal feedback (word-of-mouth)	3.09	
6	Number of course registrations	3.00	
46	Reduces information overload	3.00	
38	Percentage of course evaluations completed	2.91	
18	Number of requests for additional courses	2.86	
43	Rate of voluntary course participation	2.66	
26	Courses are short in duration	2.77	
5	Number of courses completed (required and optional)	2.68	
24	Level of associate participation after-hours	2.45	
14	Number of hits to online course catalog	2.14	

<b>Objective Training Metrics</b>		<b>Average Rating:</b>	<b>3.73</b>
35	Presence of measurable learning objectives	4.18	
34	Pre-Post course performance improvement	4.05	
48	Reduced training travel cost	3.91	
47	Reduced training travel time	3.73	
51	Reduced course material cost	3.71	
13	Reduced learning time	3.64	
4	Positive trend in test scores	3.32	
54	Number of associate certifications	3.27	

<b>Course Delivery/Usability</b>		<b>Average Rating:</b>	<b>3.82</b>
71	Course content currency (courses up-to-date)	4.59	
72	Delivery system performance and reliability	4.45	
7	Level of learner satisfaction	4.36	
67	Breadth of course subjects available (e.g., technology, business, leadership, etc.)	4.18	
64	Learning tracks are clearly defined	4.09	
67	Learning is fun!	3.95	
29	Promotes continuous learning	3.86	
68	New hire (new associate) course availability	3.82	
63	Presence of detailed syllabus and prerequisites for all courses	3.77	
70	Availability of training 24-7, year-round	3.77	
36	Course availability for all levels of learners	3.73	
77	Availability and quality of electronic reference library	3.57	
73	Supports and complements mentoring	3.50	
39	Learner suggestions are actively solicited and acted upon for course improvement	3.45	
23	Ability to access training outside of work	3.27	
64	Accommodates remedial training	3.27	
57	Access to published literature	3.23	



## APPENDIX B

### RESEARCH PRESENTATIONS, DATA COLLECTION TOOLS, AND TEMPLATES

#### BRAINSTORMING

*Brainstorming is a process for creating a broad list of ideas in response to an initial question or idea. (MIT.edu)*

*A method of shared problem solving in which all members of a group spontaneously contribute ideas. (dictionary.com)*

Brainstorming emphasizes—

- broad and creative thinking
- inviting all participants' points of view
- all relevant aspects of an issue or question are considered
- ❑ No one comments on an idea during the brainstorm
- ❑ Let the ideas flow freely!
- ❑ All ideas—however simple or creative—are welcomed and encouraged!!!

#### FOCUS STATEMENT

Generate statements (sort phrases or sentences) describing specific key performance criteria that can be used to evaluate the success of e-Learning programs for Winn-Dixie Stores, Inc. Associates.

#### FOCUS PROMPT

A specific performance criterion that can be used to evaluate the effectiveness of the e-Learning program for Winn-Dixie Stores, Inc. Associates is .....

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**Brainstorm Master Criteria Capture Worksheet**

**Researcher version 2.1**

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## e-Learning Program Effectiveness –Research Project

### Concept Mapping Homework Assignment

Thank you for agreeing to participate in Brian Petersen's research project to define e-Learning Program Effectiveness metrics. The purpose of this letter is to provide you with everything you'll need to complete the "homework" assignment mentioned during the brainstorming session you recently attended.

Because completing this assignment is critical to the success of the project, your continued efforts in returning your work by **Monday, November 20, 2006** is particularly appreciated.

Your username:

Your password: 123456

#### *Description/Purpose of Attached Files*

- Csremote—Concept System Remote. Install and use as instructed in *CM Homework.doc*.
- yourusername.mdb—This file is an MS Access (.mdb) file named using your unique username (first name, last name first initial only) as specified above. You will need to locate this file in the "Open Database" step when you run the Concept System Remote. **IMPORTANT:** An edited version of this file constitutes your homework "deliverable" that is e-mailed back.
- CM Homework.doc—This is a Word file containing complete instructions. You may find it convenient to print this file as a reference as you complete your homework assignment.

#### *File Creation & Installation*

1. Create a temporary folder named *Concept Temp* on your computer's desktop—save all remaining files to this folder
2. Save the attached file named **csremote**
3. Save the attached **yourusername.mdb** file
4. double-click the csremote file to install it

## ***Working with the CS Remote Application***

1. Open the csremote by clicking on its icon (Start, Programs, and Concept System Remote).
2. Click the "Open Database" button and navigate to the **yourusername.mdb** file that you saved in the temporary folder on your system's desktop (C:\Documents and Settings\username\Desktop\Concept Temp)
3. Type in your username and password (specified in the accompanying e-mail).
4. The Concept System should now be open and prompting you to input your User Information and Demographics. NOTE: under "User Contact Information" you are only requested to supply your Name, Title, Department. Use the "Organization or Group" field to record your Job Title, and Department Name. **YOU DO NOT NEED TO SUPPLY ADDRESS/CONTACT INFORMATION. Important:** The application contains no "save" buttons. All work is automatically "saved" when you *Exit* any given module. For example, when you are done entering User information simply "Exit User" and proceed to the Demographics module (Exit Demographics when complete, etc.). Proceed to the Sorting (you can view a list of the 91 statements by clicking on the "Statements" button, however, this is the same list that you will be sorting and rating so you don't need to click "statements" unless you'd simply like to read through the list before proceeding to sorting and rating.
5. Click the "Sorting" button. The objective for sorting is for you to group the set of 91 statements into a smaller number of piles organized by similarity of idea. ***Group the statements into piles in a way that makes sense to you.*** For example, there may be several statements describing some aspect of "usability or ease of use". These statements would be dragged/dropped into a single desktop statement pile that you might label "usability/ease of use". To view a complete set of sorting guidelines click Detailed Sorting Guidelines. After you have sorted all statements "Exit Sorting" to continue to the Rating activity.
6. Click the "Rating" button. Follow the Rating Instruction (Rate each statement for its importance as a KEY PERFORMANCE CRITERION TO MEASURE YOUR E-LEARNING PROGRAM EFFECTIVENESS using the following 5-point scale: 1=relatively unimportant; 2=somewhat important; 3=moderately important; 4=very important; 5=extremely important). Rate all statements by typing your rating in the entry field <Enter> until all statements are rated. "Exit Rating".
7. Your data entry is now complete. Select "Exit Concept System" from the "Data" drop down menu.
8. Attach your completed Access file (yourusername.mdb) to an e-mail and send it to Brian Petersen at brianp@inteLogica.com (Note: If you find two .mdb files in your temporary directory please send both files back).

### **Detailed Sorting Guidelines**

***Group the statements into piles in a way that makes sense to you, following these guidelines:***

- Group the statements for how *similar in meaning* they are to one another. Do not group the statements according to how important they

are, how high a priority they have, etc. Each statement will be rated for its importance as a separate activity.

- There is no right or wrong way to group the statements. You will probably find that you could group the statements in several sensible ways. Pick the arrangement that feels best to you.
- You cannot put one statement into two piles at the same time. Each statement must be put into only one pile.
- People differ on how many piles they wind up with. Typical sorting results might include anywhere from 8 to 20 statement piles.
- A statement may be put alone as its own pile if you think it is completely unrelated to the other statements or it stands alone as a unique idea.
- Make sure that every statement is put somewhere. Do not leave any statements out.
- Do not create any piles that are “miscellaneous” or “junk” piles. If you have statements left over that you can’t place, put each statement in its own pile.

**Table: e-Learning Key Performance Criteria (KPC's)  
for  
e-Learning Effectiveness Index (Scorecard)  
Concept Mapping Homework Tracking Log**

Updated: 4/13/2007 7:43:00 AM

Participant	CM Username	Group	Part I Homework Returned (Concept Map * MDB)	Part II Homework Returned (Performance Reqmts.XLS)
1. David S	daves	Train	MDB received 10/21/06	Received 10/31/06
2. Susan G	susang	Train	MDB received 10/25/06	Received 10/31/06
3. Dennis W	dennisw	Train	MDB received 10/21/06	Received 10/29/06
4. Brian O	briano	Train	MDB received 10/21/06	Received 10/30/06
5. Nancy R	nancyr	Train	MDB received 10/21/06	Received 10/31/06
6. Shari W	shariw	Train	MDB received 10/21/06	Received 10/30/06
7. Alvin M	alvinm	Train	MDB received 10/21/06	Received 10/30/06
8. Jon T	jont	Train	MDB received 10/23/06	Received 10/31/06
9. Ed H	edh	Train	MDB received 10/22/06	Received 10/30/06
10. Brian L	brianl	User	MDB received 10/18/06	Received 10/31/06
11. Shiela P	shielap	User	MDB received 10/18/06	Received 10/30/06
12. Don R	donr	User	MDB received 10/16/06	Received 10/31/06
13. Michael C	michaelc	User	MDB received 10/21/06	Received 10/31/06
14. Gary R	garyr	User	MDB received 10/21/06	Received 10/31/06
15. Nick M	nickm	User	MDB received 10/21/06	Received 10/30/06
16. Ernie M	erniem	User	MDB received 10/21/06	Received 10/30/06
17. Marsha K	marshak	User	MDB received 10/18/06	Vacation
18. Ron L	ronl	Manager	MDB received 10/17/06	Received 10/18/06
19. Michael B	mikeb	Manager	MDB received 10/17/06	Received 10/17/06
20. Rich D	richd	Manager	MDB received 10/18/06	Received 10/31/06
21. Harvey L	harveyl	Manager	MDB received 10/22/06	Received 10/30/06
22. Keith S	keiths	Manager	MDB received 10/18/06	Received 10/26/06
23. Gene C	genec	Manager	Dropped out	

## e-Learning Program Effectiveness Survey

Thank you for participating in this research. We are investigating how effective the e-learning program is working within your company. Please print out this document. Then rate each Key Performance Criteria statement below by circling one ranking. If you feel that the KPI doesn't apply or is not relevant to you then circle NA on the sheet. Please return to Brian Petersen (949-632-3215) by January 15, 2007. Thank you!

**Please provide us with information about yourself. No names please, survey results are anonymous.**

Gender       Male    Female      Job function \_\_\_\_\_

Months on the job with the company \_\_\_\_\_

Total years in this specific job function at any company \_\_\_\_\_

Total years you have been using e-learning with any company \_\_\_\_\_

Please read each Key Performance Criteria statement in the sections below and then circle a number from 1-4 to rate the criteria. (1=lowest and 4=highest). If you are do not think the KPC Statement is applicable, then circle NA in the Not Applicable column.	Disagree	Somewhat Disagree	Somewhat Agree	Agree	Not Applicable
<b>Affecting my Job Performance.</b>					
My on-the-job performance has improved from training.	1	2	3	4	NA
I am able to use the new knowledge from my e-learning training in my job.	1	2	3	4	NA
My performance as an associate has improved due to the	1	2	3	4	NA



learning I acquired from our e-learning program.					
The number of skills I can transfer to my job has increased due to my e-learning training that I have taken.	1	2	3	4	NA
I have learned information relevant to current projects and projects planned for the future from our e-learning program.	1	2	3	4	NA
I have acquired new skills and received knowledge faster from our e-learning program.	1	2	3	4	NA
<b>Enhancing my Career.</b>					
My e-learning training has assisted my growth and career development.	1	2	3	4	NA
My e-learning training has supported me in assisting in the strategic business direction of our company.	1	2	3	4	NA
My communication skills have improved through the use of our e-learning programs.	1	2	3	4	NA
I have benefited from this training provided by e-learning.	1	2	3	4	NA
The company's recruiting ability has improved due to our e-learning programs.	1	2	3	4	NA
<b>Impacting our Business.</b>					
The servicing of my internal customers has improved as an outcome of the e-learning training I have taken.	1	2	3	4	NA
My core competencies levels for my job performance have improved because of our e-learning program.	1	2	3	4	NA
Our company's overall organizational performance has improved due to our e-learning programs that are available.	1	2	3	4	NA
I have felt my overall satisfaction and job morale increased due to our e-learning program.	1	2	3	4	NA
Our company's profitability has grown as an outcome of our e-learning program.	1	2	3	4	NA
Best practices and new technology training has been delivered as required through the use of our e-learning programs.	1	2	3	4	NA
<b>Determining Organizational Sponsorship and</b>					

<b>Commitment.</b>						
Management has encouraged me to take training at work.	1	2	3	4	NA	NA
Management has been more supportive of my work after taking e-learning training for my job.	1	2	3	4	NA	NA
A learning environment has been fostered at our company.	1	2	3	4	NA	NA
Learning has been integrated with the performance review process.	1	2	3	4	NA	NA
Supervisors have been able to observe my learning progress through our e-learning system.	1	2	3	4	NA	NA
My training records are available for review and management.	1	2	3	4	NA	NA
<b>Measuring e-Learning Curriculum.</b>						
I found course navigation from screen to screen has been easy in the e-learning training.	1	2	3	4	NA	NA
This e-learning training is "Just-in-time" for my job needs.	1	2	3	4	NA	NA
This e-learning training has been interesting and has kept my attention.	1	2	3	4	NA	NA
Access to the e-learning training has been easy.	1	2	3	4	NA	NA
The modular structure of our e-learning training has allowed each course to build on another.	1	2	3	4	NA	NA
This e-learning training has accommodated multiple learning styles.	1	2	3	4	NA	NA
<b>Quantifying Training Metrics.</b>						
The e-learning courses contain measurable learning objectives.	1	2	3	4	NA	NA
My performance has improved from the pre-course to the post-course when I take e-learning training.	1	2	3	4	NA	NA
My cost for travel associated with training has been reduced.	1	2	3	4	NA	NA
Time lost from work for training travel has decreased due to our e-learning programs.	1	2	3	4	NA	NA
My course material costs were less with this e-learning training.	1	2	3	4	NA	NA

My time required to take new required training has been reduced by having our e-learning program.	1	2	3	4	NA
<b>Appraising Course Delivery / Usability.</b>					
The e-learning program has current business updates incorporated into all training delivered.	1	2	3	4	NA
The e-learning delivery system performed and was reliable.	1	2	3	4	NA
My learner's satisfaction level has increased due to our e-learning program.	1	2	3	4	NA
Our e-learning program provides a broad range of course topics to meet my current learning needs.	1	2	3	4	NA
My learning tracks have been clearly defined within the learning system.	1	2	3	4	NA
Learning has been fun - an enjoyable work activity.	1	2	3	4	NA

All information will be kept confidential.

## APPENDIX C

### CONSENT TO PARTICIPATE AND SUMMARY PROTOCOL FORM (SPF)

#### CONSENT TO PARTICIPATE

##### Measuring e-Learning Program Effectiveness: A Stakeholder Approach to Scorecarding Performance.

(A Ph.D. dissertation)

**This is to state that I agree to participate in a program of research being conducted by Brian Petersen of the Educational Technology Department of Concordia University. His contact information is as follows:**

Tel: \_\_\_\_\_  
Email: \_\_\_\_\_

#### A. PURPOSE

I have been informed that the purpose of the research is as follows. Brian Petersen is exploring organizational stakeholder variation in perceptions about key performance criteria being used as metrics for evaluating e-learning program effectiveness. It will contribute to the knowledge of trends in organizational development and e-learning program design and evaluation.

#### B. PROCEDURES

Group 1: In phase one and two, the research for this study will occur at the case organizations corporate headquarters in the Foundation room located at 5050 Edgewood Court in Jacksonville, Florida. Each participant will be involved in the following activities:

1. A two-hour group brainstorming session using concept mapping techniques to determine key performance criteria for use in measuring e-learning program effectiveness. This session will take approximately 1.5 hours.
2. A half-hour homework activity using your office computer and a software application from Concept Systems. You will organize the brainstorming statements from the first session into groups.
3. A second group session will be held one week after the after activity 1, and again will be held again in the Founders room. At this session, you will review the concept maps and give the visual concept maps group names. This session will take approximately one- hour.

4. A final half-hour homework session will be performed back in your office. You will receive a document in Microsoft Excel© with all of the final key performance criteria which your group established in the brainstorming session. For each criterion you will decide where it fits in terms of Quality under the following headings of accuracy, class and Novelty. This will be done on your computer and returned to the researcher.

Group 2: In phase three, four supervisors of e-learning programs at four other organizations will participate in a one-hour interview with the researcher at their office location. You will be asked to answer a series of open-ended questions regarding an e-Learning Effectiveness Index (e-LEI) scorecard, which is a survey to determine whether your e-learning programs in your organization are meeting certain business criteria.

### **C. RISKS AND BENEFITS**

Procedures in this study have been taken to prevent putting someone at risk as part of the research efforts. All aspects of participation will be known by potential participants prior to their involvement in the study. The measurement tools or procedures do not contain anything that could indicate the need for psychological intervention. It is made clear that the tools and procedures focus on the participant's ideas of criteria for measuring e-learning programs. In the unlikely event of an unexpected risk situation, researchers will respect the human rights and privacy of the participant.

This research study has important implications for the measurement and evaluation of e-learning program effectiveness. With clearly defined performance criteria available for evaluating e-learning programs, organizations can clarify their corporate learning vision through measurable goals and outcomes. This vision drives the learning that takes place within the organization, aligns the stakeholders to the organization's overarching business strategy and reveals their successes. To achieve this goal, organizations need to measure what they are doing and how well they are achieving their goals against an initial set of performance criteria or benchmarks

The basis of a strategic e-learning program scorecard development is a methodology that will enable training managers to establish their strategic e-learning program objectives across a holistic view of organizational training and development needs and the business objectives, and to identify relevant measures that will allow them to control and monitor e-learning program performance against these objectives.

### **D. CONDITIONS OF PARTICIPATION**

- I understand that I am free to withdraw my consent and discontinue my participation at anytime without negative consequences.
- I understand that my participation in this study is CONFIDENTIAL (i.e., the researcher will know, but not disclose my identity).
- I understand that the data from this study may be published.

I HAVE CAREFULLY STUDIED THE ABOVE AND UNDERSTAND THIS AGREEMENT. I FREELY CONSENT AND VOLUNTARILY AGREE TO PARTICIPATE IN THIS STUDY.

I would like a copy of the study findings when they are available. Yes \_\_\_ No \_\_\_

NAME: (please print)

---

SIGNATURE:

---

DATE: \_\_\_\_\_

If at any time you have questions about your rights as a research participant, please contact Adela Reid, Research Ethics and Compliance Officer, Concordia University, at (514) 848-2424 x 7481 or by email at [areid@alcor.concordia.ca](mailto:areid@alcor.concordia.ca)

APPENDIX D

PHASE III – PART A RESEARCH RESULT DOCUMENTS

FROM e-LEI DATA COLLECTION

Source information		Source 1		Source 2		Source 3		Source 4		Source 5	
Gender	Job function	Female	Male	Female	Male	Female	Male	Female	Male	Female	Male
	Months on the job with the company	18		62		24		130		2	
	Total years in this specific job function at any company	1		2		6		7		6	
	Total years you have been using e-learning with any company	0.5		2		1		2.5		3	
	<b>Affecting my Job Performance</b>										
	My on-the-job performance has improved.	4		3		3		4		4	
	I am able to use the new knowledge from my e-learning training in my job.	4		4		3		4		4	
	My performance as an associate has improved due to the learning I acquired from our e-learning program.	4		4		4		4		4	
	The number of skills I can transfer to my job has increased due to my e-learning training that I have taken.	4		4		3		4		4	
	I have learned information relevant to current projects and projects planned for the future from our e-learning program.	4		2		1		1		2	
	I have acquired new skills and received knowledge faster from our e-learning program.	4		4		3		3		4	
	<b>Enhancing my Career</b>										
	My e-learning training has assisted my growth and career development.	4		4		3		4		4	
	My e-learning training has supported me in assisting in the strategic business direction of our company.	2		3		2		3		2	
	My communication skills have improved through the use of our e-learning programs.	3		3		2		4		1	
	I have benefited from this training provided by e-learning.	4		4		3		4		4	
	The company's recruiting ability has improved due to our e-learning programs.	2		2		2		2		1	
	<b>Impacting our Business</b>										
	The servicing of my internal customers has improved as an outcome of the e-learning training I have taken.	4		3		1		1		2	
	My core competencies levels for my job performance have improved because of our e-learning program.	4		4		3		4		3	
	Our company's overall organizational performance has improved due to our e-learning programs that are available.	4		4		3		1		2	
	I have felt my overall satisfaction and job morale increased due to our e-learning program.	4		3		1		3		4	
	Our company's profitability has grown as an outcome of our e-learning program.	4		3		3		2		2	
	Best practices and new technology training has been delivered as required through the use of our e-learning programs.	1		2		2		2		3	
	<b>Determining Operational Sponsorship and Commitment</b>										
	Management has encouraged me to take training at work.	1		2		2		4		1	
	Management has been more supportive of my work after taking e-learning training for my job.	1		4		1		3		2	
	A learning environment has been fostered at our company.	1		1		2		4		2	
	Learning has been integrated with the performance review process.	3		3		3		3		3	
	Supervisors have been able to observe my learning progress through our e-learning system.	4		3		4		3		3	
	My training records are available for review and management.	4		3		4		3		4	
	<b>Measuring e-Learning Competency</b>										
	I found course navigation from screen to screen has been easy in the e-learning training.	3		3		3		3		3	
	This e-learning training is "Just-in-time" for my job needs.	4		3		3		4		4	
	This e-learning training has been interesting and has kept my attention.	4		3		2		2		3	
	Access to the e-learning training has been easy.	4		3		4		3		3	
	The modular structure of our e-learning training has allowed each course to build on another.	2		3		2		2		2	
	This e-learning training has accommodated multiple learning styles.	1		3		4		2		3	
	<b>Optimizing Training Metrics</b>										
	The e-learning courses contain measurable learning objectives.	3		4		3		2		3	
	My performance has improved from the pre-course to the post-course when I take e-learning training.	4		4		3		4		4	
	My cost for travel associated with training has been reduced.	3		4		4		4		4	
	Time lost from work for training travel has decreased due to our e-learning programs.	3		4		4		4		3	
	My course material costs were less with this e-learning training.	3		4		4		4		3	
	My time required to take new required training has been reduced by having our e-learning program.	2		1		2		3		3	
	<b>Appraising Course Delivery/Usability</b>										
	The e-learning program has current business updates incorporated into all training delivered.	1		1		1		1		1	
	The e-learning delivery system performed and was reliable.	4		3		3		3		3	
	My learner's satisfaction level has increased due to our e-learning program.	4		4		4		4		3	
	Our e-learning program provides a broad range of course topics to meet my current learning needs.	3		3		3		4		3	
	My learning tracks have been clearly defined within the learning system.	3		3		3		3		2	
	Learning has been fun - an enjoyable work activity.	4		4		4		4		4	



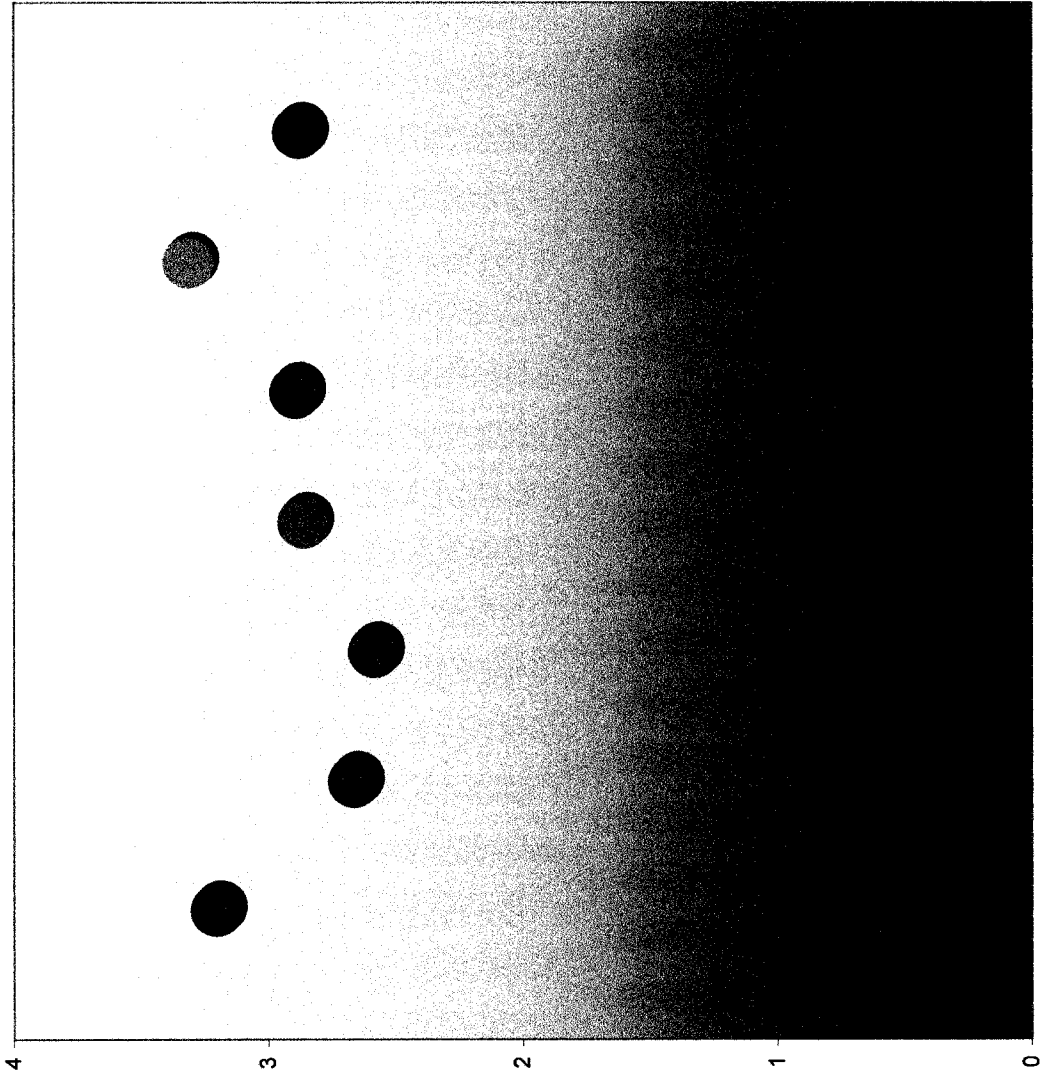
Source information		Source 6		Source 7		Source 8		Source 9		Source 10	
Gender		Male	Female	Male	Female	Male	Female	Male	Female	Male	Female
Job function		C programmer	Manager/Operations	System Admin	Operation support	Assistant to V.P.					
Months on the job with the company		110	36	3	26	18					
Total years in this specific job function at any company		22	2	19	6	1					
Total years you have been using e-learning with any company		2	2	2	8	8					
<b>Assessing my Job Performance</b>											
My on-the-job performance has improved.		3	2	4	4	4					
I am able to use the new knowledge from my e-learning training in my job.		4	3	4	3	3					
My performance as an associate has improved due to the learning I acquired from our e-learning program.		3	3	4	4	4					
The number of skills I can transfer to my job has increased due to my e-learning training that I have taken.		4	4	3	4	4					
I have learned information relevant to current projects and projects planned for the future from our e-learning program.		1	1	2	2	2					
I have acquired new skills and received knowledge faster from our e-learning program.		4	3	3	3	2					
<b>Enhancing my Career</b>											
My e-learning training has assisted my growth and career development.		4	2	4	3	4					
My e-learning training has supported me in assisting in the strategic business direction of our company.		3	2	2	1	1					
My communication skills have improved through the use of our e-learning programs.		4	3	3	2	2					
I have benefited from this training provided by e-learning.		4	3	4	4	4					
The company's recruiting ability has improved due to our e-learning programs.		2	1	2	1	1					
<b>Impacting Our Business</b>											
The servicing of my internal customers has improved as an outcome of the e-learning training I have taken.		4	3	3	1	4					
My core competencies levels for my job performance have improved because of our e-learning program.		4	4	4	4	3					
Our company's overall organizational performance has improved due to our e-learning programs that are available.		2	3	3	3	4					
I have felt my overall satisfaction and job morale increased due to our e-learning program.		3	2	3	3	2					
Our company's profitability has grown as an outcome of our e-learning program.		2	2	2	3	3					
Best practices and new technology training has been delivered as required through the use of our e-learning programs.		1	1	1	2	1					
<b>Defining Organizational Supportability and Commitment</b>											
Management has encouraged me to take training at work.		3	2	2	1	1					
Management has been more supportive of my work after taking e-learning training for my job.		3	2	1	1	1					
A learning environment has been fostered at our company.		2	2	3	1	2					
Learning has been integrated with the performance review process.		3	3	3	3	3					
Supervisors have been able to observe my learning progress through our e-learning system.		4	4	4	4	3					
My training records are available for review and management.		4	4	4	4	4					
<b>Measuring e-Learning Curriculum</b>											
I found course navigation from screen to screen has been easy in the e-learning training.		3	3	4	3	3					
This e-learning training is "Just-in-time" for my job needs.		4	2	4	3	3					
This e-learning training has been interesting and has kept my attention.		2	2	4	1	2					
Access to the e-learning training has been easy.		4	4	3	4	3					
The modular structure of our e-learning training has allowed each course to build on another.		2	2	3	1	1					
This e-learning training has accommodated multiple learning styles.		3	NA	3	1	1					
<b>Quantifying Training Metrics</b>											
The e-learning courses contain measurable learning objectives.		3	2	4	3	3					
My performance has improved from the pre-course to the post-course when I take e-learning training.		3	2	4	4	4					
My cost for travel associated with training has decreased.		4	4	4	4	4					
Time lost from work for training travel has decreased due to our e-learning programs.		4	4	3	4	4					
My course material costs were less with this e-learning training.		4	4	4	4	4					
My time required to take new required training has been reduced by having our e-learning program.		1	1	4	1	1					
<b>Applying Course Delivery Ability</b>											
The e-learning program has current business updates incorporated into all training delivered.		1	1	2	1	1					
The e-learning delivery system performed and was reliable.		3	4	4	3	3					
My learner's satisfaction level has increased due to our e-learning program.		2	3	3	2	2					
Our e-learning program provides a broad range of course topics to meet my current learning needs.		4	4	3	3	4					
My learning tracks have been clearly defined within the learning system.		4	3	4	2	3					
Learning has been fun - an enjoyable work activity.		4	3	3	4	4					

Source information		Source 11		Source 12		Source 13	
Gender	Job function	M.F. Programmer	Female	C++ Programmer	Male	C++ Programmer	Male
	Months on the job with the company		17		39		6
	Total years in this specific job function at any company		3		9		16
	Total years you have been using e-learning with any company		1.5		4		2
	<b>Affecting my Job Performance</b>						
	My on-the-job performance has improved.		4		4		3
	I am able to use the new knowledge from my e-learning training in my job.		4		4		4
	My performance as an associate has improved due to the learning I acquired from our e-learning program.		4		4		4
	The number of skills I can transfer to my job has increased due to my e-learning training that I have taken.		3		3		4
	I have learned information relevant to current projects and projects planned for the future from our e-learning program.		1		2		1
	I have acquired new skills and received knowledge faster from our e-learning program.		3		4		4
	<b>Learning my Career</b>						
	My e-learning training has assisted my growth and career development.		1		4		4
	My e-learning training has supported me in assisting in the strategic business direction of our company.		1		2		2
	My communication skills have improved through the use of our e-learning programs.		2		1		3
	I have benefited from this training provided by e-learning.		4		4		3
	The company's recruiting ability has improved due to our e-learning programs.		2		2		2
	<b>Impacting our Business</b>						
	The servicing of my internal customers has improved as an outcome of the e-learning training I have taken.		2		3		1
	My core competencies levels for my job performance have improved because of our e-learning program.		3		4		3
	Our company's overall organizational performance has improved due to our e-learning programs that are available.		3		2		2
	I have felt my overall satisfaction and job morale increased due to our e-learning program.		2		3		3
	Our company's profitability has grown as an outcome of our e-learning program.		2		2		1
	Best practices and new technology training has been delivered as required through the use of our e-learning programs.		2		1		1
	<b>Determining Organizational Sponsorship and Commitment</b>						
	Management has encouraged me to take training at work.		4		3		2
	Management has been more supportive of my work after taking e-learning training for my job.		3		3		3
	A learning environment has been fostered at our company.		2		2		3
	Learning has been integrated with the performance review process.		2		3		3
	Supervisors have been able to observe my learning progress through our e-learning system.		NA		4		4
	My training records are available for review and management.		4		4		4
	<b>Measuring e-Learning Outcomes</b>						
	I found course navigation from screen to screen has been easy in the e-learning training.		3		4		4
	This e-learning training is "Just-in-time" for my job needs.		3		3		3
	This e-learning training has been interesting and has kept my attention.		4		4		4
	Access to the e-learning training has been easy.		3		4		4
	The modular structure of our e-learning training has allowed each course to build on another.		NA		3		2
	This e-learning training has accommodated multiple learning styles.		NA		2		NA
	<b>Equitying Training Metrics</b>						
	The e-learning courses contain measurable learning objectives.		3		4		3
	My performance has improved from the pre-course to the post-course when I take e-learning training.		3		3		3
	My cost for travel associated with training has been reduced.		4		4		4
	Time lost from work for training travel has decreased due to our e-learning programs.		2		4		1
	My course material costs were less with this e-learning training.		4		4		4
	My time required to take new required training has been reduced by having our e-learning program.		3		1		2
	<b>Applying Course Delivery Ability</b>						
	The e-learning program has current business updates incorporated into all training delivered.		2		1		1
	The e-learning delivery system performed and was reliable.		3		4		3
	My learner's satisfaction level has increased due to our e-learning program.		3		4		3
	Our e-learning program provides a broad range of course topics to meet my current learning needs.		2		3		4
	My learning tracks have been clearly defined within the learning system.		2		4		4
	Learning has been fun - an enjoyable work activity.		3		4		3

Source information		Source 14		Source 15		Source 16	
Gender		Female	Male	Female	Male	Female	Male
Job function		Manager - Analyst	Business analyst	Business analyst	Business analyst	Business analyst	Business analyst
Months on the job with the company		17	13	13	88	14	1
Total years in this specific job function at any company		6	29	1			
Total years you have been using e-learning with any company		6	1				
<b>Affecting my Job Performance</b>							
My on-the-job performance has improved.		4	3	3	4	4	4
I am able to use the new knowledge from my e-learning training in my job.		4	3	3	4	4	4
My performance as an associate has improved due to the learning I acquired from our e-learning program.		3	3	3	4	4	4
The number of skills I can transfer to my job has increased due to my e-learning training that I have taken.		3	2	2	3	3	3
I have learned information relevant to current projects and projects planned for the future from our e-learning program.		1	1	1	2	2	2
I have acquired new skills and received knowledge faster from our e-learning program.		3	3	3	4	4	4
<b>Enhancing my Career</b>							
My e-learning training has assisted my growth and career development.		4	3	3	3	3	3
My e-learning training has supported me in assisting in the strategic business direction of our company.		2	1	1	1	1	1
My communication skills have improved through the use of our e-learning programs.		3	3	3	2	2	2
I have benefited from this training provided by e-learning.		4	3	3	4	4	4
The company's recruiting ability has improved due to our e-learning programs.		2	1	1	2	2	2
<b>Impacting our Business</b>							
The servicing of my internal customers has improved as an outcome of the e-learning training I have taken.		3	4	4	2	2	2
My core competencies levels for my job performance have improved because of our e-learning program.		4	4	4	4	4	4
Our company's overall organizational performance has improved due to our e-learning programs that are available.		2	2	2	3	3	3
I have felt my overall satisfaction and job morale increased due to our e-learning program.		3	1	1	3	3	3
Our company's profitability has grown as an outcome of our e-learning program.		3	2	2	1	1	1
Best practices and new technology training has been delivered as required through the use of our e-learning programs.		3	1	1	3	3	3
<b>Determining Organizational Sponsorship and Commitment</b>							
Management has encouraged me to take training at work.		4	3	3	3	3	3
Management has been more supportive of my work after taking e-learning training for my job.		3	2	2	3	3	3
A learning environment has been fostered at our company.		3	1	1	3	3	3
Learning has been integrated with the performance review process.		4	3	3	4	4	4
Supervisors have been able to observe my learning progress through our e-learning system.		4	3	3	4	4	4
My training records are available for review and management.		4	3	3	4	4	4
<b>Measuring e-Learning Curriculum</b>							
I found course navigation from screen to screen has been easy in the e-learning training.		3	3	3	3	3	3
This e-learning training is "Just-in-time" for my job needs.		3	3	3	4	4	4
This e-learning training has been interesting and has kept my attention.		3	3	3	2	2	2
Access to the e-learning training has been easy.		4	3	3	4	4	4
The modular structure of our e-learning training has allowed each course to build on another.		2	3	3	3	3	3
This e-learning training has accommodated multiple learning styles.		2	2	2	3	3	3
<b>Certifying Training Metrics</b>							
The e-learning courses contain measurable learning objectives.		3	3	3	4	4	4
My performance has improved from the pre-course to the post-course when I take e-learning training.		3	3	3	3	3	3
My cost for travel associated with training has been reduced.		4	4	4	4	4	4
Time lost from work for training travel has decreased due to our e-learning programs.		4	4	4	4	4	4
My course material costs were less with this e-learning training.		4	4	4	4	4	4
My time required to take new required training has been reduced by having our e-learning program.		3	2	2	4	4	4
<b>Applying Course Delivery Methodology</b>							
The e-learning program has current business updates incorporated into all training delivered.		1	2	2	1	1	1
The e-learning delivery system performed and was reliable.		4	3	3	4	4	4
My learner's satisfaction level has increased due to our e-learning program.		3	3	3	2	2	2
Our e-learning program provides a broad range of course topics to meet my current learning needs.		4	3	3	3	3	3
My learning tracks have been clearly defined within the learning system.		3	3	3	3	3	3
Learning has been fun - an enjoyable work activity.			2	2	3	3	3

Source information	Remarks/Observations
Gender	Gender in the sample are balanced.
Job function	Job functions are mainly related to software industr
Months on the job with the company	Variation from 2 to 130 months was observed.
Total years in this specific job function at any company	Variation from 1 to 29 years was observed.
Total years you have been using e-learning with any company	Variation from 0 to 8 years was observed.
<b>Measuring Job Performance</b>	<b>Majority</b>
My on-the-job performance has improved.	Agree
I am able to use the new knowledge from my e-learning training in my job.	Agree
My performance as an associate has improved due to the learning I acquired from our e-learning program.	Agree
The number of skills I can transfer to my job has increased due to my e-learning training that I have taken.	Agree
I have learned information relevant to current projects and projects planned for the future from our e-learning program.	Disagree
I have acquired new skills and received knowledge faster from our e-learning program.	Agree
<b>Enhancing My Career</b>	<b>Majority</b>
My e-learning training has assisted my growth and career development.	Agree
My e-learning training has supported me in assisting in the strategic business direction of our company.	Somewhat Disagree
My communication skills have improved through the use of our e-learning programs.	Somewhat Agree
I have benefited from this training provided by e-learning.	Agree
The company's recruiting ability has improved due to our e-learning programs.	Somewhat Disagree
<b>Impacting Our Business</b>	<b>Majority</b>
The servicing of my internal customers has improved as an outcome of the e-learning training I have taken.	Somewhat Agree
My core competencies levels for my job performance have improved because of our e-learning program.	Agree
Our company's overall organizational performance has improved due to our e-learning programs that are available.	Somewhat Agree
I have felt my overall satisfaction and job morale increased due to our e-learning program.	Somewhat Agree
Our company's profitability has grown as an outcome of our e-learning program.	Somewhat Disagree
Best practices and new technology training has been delivered as required through the use of our e-learning programs.	Somewhat Disagree
<b>Ensuring Organizational Supportability and Commitment</b>	<b>Majority</b>
Management has encouraged me to take training at work.	Somewhat Disagree
Management has been more supportive of my work after taking e-learning training for my job.	Somewhat Agree
A learning environment has been fostered at our company.	Somewhat Disagree
Learning has been integrated with the performance review process.	Somewhat Agree
Supervisors have been able to observe my learning progress through our e-learning system.	Agree
My training records are available for review and management.	Agree
<b>Measuring e-Learning Curriculum</b>	<b>Majority</b>
I found course navigation from screen to screen has been easy in the e-learning training.	Somewhat Agree
This e-learning training is "Just-in-time" for my job needs.	Somewhat Agree
This e-learning training has been interesting and has kept my attention.	Somewhat Agree
Access to the e-learning training has been easy.	Agree
The modular structure of our e-learning training has allowed each course to build on another.	Somewhat Disagree
This e-learning training has accommodated multiple learning styles.	Somewhat Disagree
<b>Measuring Training Metrics</b>	<b>Majority</b>
The e-learning courses contain measurable learning objectives.	Somewhat Agree
My performance has improved from the pre-course to the post-course when I take e-learning training.	Somewhat Agree
My cost for travel associated with training has been reduced.	Agree
Time lost from work for training travel has decreased due to our e-learning programs.	Agree
My course material costs were less with this e-learning training.	Agree
My time required to take new required training has been reduced by having our e-learning program.	Somewhat Disagree
<b>Assessing Course Delivery Reliability</b>	<b>Majority</b>
The e-learning program has current business updates incorporated into all training delivered.	Disagree
The e-learning delivery system performed and was reliable.	Somewhat Agree
My learner's satisfaction level has increased due to our e-learning program.	Somewhat Agree
Our e-learning program provides a broad range of course topics to meet my current learning needs.	Somewhat Agree
My learning tracks have been clearly defined within the learning system.	Somewhat Agree
Learning has been fun - an enjoyable work activity.	Somewhat Agree

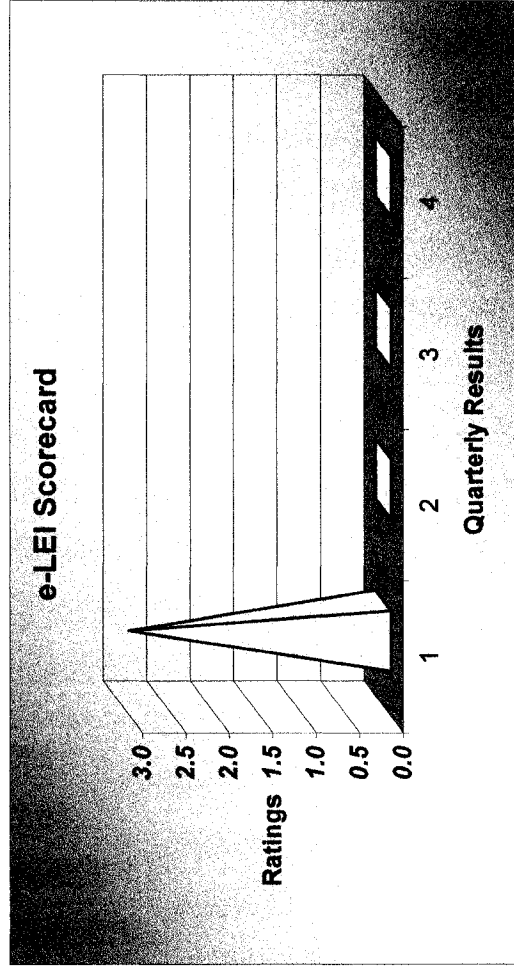
Source information	Univariate analyses										Central tendency			Dispersion						
	Distribution frequency					NA	Mean	Median	Mode	Dispersion										
	1	2	3	4	5					Standard Deviation	Variance	Skewness	Kurtosis							
Gender	8.0																			
Months on the job with the company	9.0	3.0	1.0	1.0	1.0	2.0	38.3	21	18			2	1.30							39.2
Total years in this specific job function at	5.0	6.0	1.0	2.0	2.0	2.0	9.3	6	6			1	2.9							8.3
Total years you have been using e-learning	10.0	3.0	1.0	2.0	2.0	0.0	2.9	2	2			0.5	8							2.4
<b>Measuring My Job Performance</b>																				
My on-the-job performance has improved.	0.0	1.0	5.0	10.0	10.0	NA	3.2	3.3	3.3			2.2	3.7							0.6
I am able to use the new knowledge from	0.0	0.0	5.0	11.0	0.0	0.0	3.6	4	4			2	4							0.8
My performance as an associate has improved	0.0	0.0	4.0	12.0	0.0	0.0	3.8	4	4			3	4							0.5
The number of skills I can transfer to my	0.0	1.0	6.0	8.0	1.0	0.0	3.5	4	4			2	4							0.4
I have learned information relevant to current	10.0	6.0	0.0	0.0	0.0	0.0	1.4	1	1			1	2							0.5
I have acquired new skills and received knowledge	0.0	1.0	8.0	7.0	0.0	0.0	3.4	3	3			2	4							0.6
<b>Measuring My Career</b>																				
My e-learning training has assisted my growth	1.0	1.0	4.0	10.0	0.0	0.0	2.7	3.0	3.0			1.4	3.4							0.7
My e-learning training has supported me in	5.0	8.0	3.0	0.0	0.0	0.0	1.9	2	2			1	3							0.7
My communication skills have improved through	2.0	5.0	7.0	2.0	0.0	0.0	2.6	3	3			1	4							0.9
The company's recruiting ability has improved	5.0	11.0	0.0	0.0	0.0	0.0	3.8	4	4			3	4							0.4
The servicing of my internal customers has	4.0	3.0	5.0	4.0	0.0	0.0	2.6	3	3			1	4							1.2
My core competencies levels for my job have	0.0	0.0	5.0	11.0	0.0	0.0	3.7	4	4			3	4							0.5
Our company's overall organizational performance	1.0	7.0	6.0	2.0	0.0	0.0	2.6	2.5	2			1	4							0.8
I have felt my overall satisfaction and job	2.0	3.0	9.0	2.0	0.0	0.0	2.7	3	3			1	4							0.9
Our company's profitability has grown as a	2.0	8.0	5.0	1.0	0.0	0.0	2.3	2	2			1	4							0.8
Best practices and new technology training	8.0	5.0	3.0	0.0	0.0	0.0	1.7	1.5	1			1	3							0.8
<b>Measuring My Training</b>																				
Management has encouraged me to take	4.0	5.0	4.0	3.0	0.0	0.0	2.4	2	2			1	4							1.1
Management has been more supportive of	5.0	3.0	7.0	1.0	0.0	0.0	2.9	2.5	3			1	4							1.0
A learning environment has been fostered	4.0	7.0	4.0	1.0	0.0	0.0	2.1	2	2			1	4							0.9
Learning has been integrated with the performance	0.0	1.0	12.0	2.0	0.0	0.0	3.1	3	3			2	4							0.5
Supervisors have been able to observe my	0.0	0.0	6.0	9.0	1.0	0.0	3.6	4	4			3	4							0.5
My training records are available for review	0.0	0.0	4.0	12.0	0.0	0.0	3.8	4	4			3	4							0.4
<b>Measuring My Training Effectiveness</b>																				
I found course navigation from screen to	0.0	0.0	13.0	3.0	0.0	0.0	2.9	2.8	2.8			1.8	3.8							0.7
This e-learning training is "just-in-time" for	0.0	1.0	9.0	6.0	0.0	0.0	3.5	3	3			2	4							0.6
This e-learning training has been interesting	1.0	6.0	5.0	4.0	0.0	0.0	2.8	3	2			1	4							0.9
Access to the e-learning training has been	0.0	0.0	6.0	9.0	0.0	0.0	3.6	4	4			3	4							0.5
The modular structure of our e-learning training																				
training has allowed each course to build on another.	2.0	8.0	5.0	0.0	1.0	2.2	2.2	2	2			1	3							0.7
This e-learning training has accommodated	3.0	4.0	5.0	1.0	3.0	2.3	2.3	2	2			1	4							0.9
<b>Measuring My Training Impact</b>																				
The e-learning courses contain measurable	0.0	2.0	10.0	4.0	0.0	0.0	3.1	3	3			2.2	4.0							0.6
My performance has improved from the pre-course																				
to the post-course when I take e-learning training.	0.0	1.0	9.0	6.0	0.0	0.0	3.3	3	3			2	4							0.6
My cost for travel associated with training	0.0	0.0	0.0	16.0	0.0	0.0	4.0	4	4			4	4							0.0
Time lost from work for training travel has	1.0	1.0	4.0	10.0	0.0	0.0	3.4	4	4			1	4							0.8
My course material costs were less with	0.0	0.0	2.0	14.0	0.0	0.0	3.9	4	4			3	4							0.3
My time required to take new required training	6.0	4.0	4.0	2.0	0.0	0.0	2.1	2	1			1	4							1.1
<b>Measuring My Course Delivery</b>																				
The e-learning program has current business	13.0	3.0	0.0	0.0	0.0	0.0	1.2	1	1			1	2							0.4
The e-learning delivery system performed	0.0	0.0	10.0	6.0	0.0	0.0	3.4	3	3			3	4							0.5
My learner's satisfaction level has increased	0.0	5.0	7.0	4.0	0.0	0.0	2.9	3	3			2	4							0.6
Our e-learning program provides a broad																				
range of course topics to meet my current learning needs.	0.0	1.0	9.0	6.0	0.0	0.0	3.3	3	3			2	4							0.6
My learning tracks have been clearly defined	0.0	3.0	7.0	5.0	0.0	0.0	3.1	3	3			2	4							0.7
Learning has been fun - an enjoyable work	0.0	1.0	8.0	6.0	0.0	0.0	3.3	3	3			2	4							0.6



- Affecting my Job Performance.
- Enhancing my Career.
- Impacting our Business.
- Determining Organizational Sponsorship and Commitment.
- Measuring e-Learning Curriculum.
- Quantifying Training Metrics.
- Appraising Course Delivery/Usability.

White zone ==> Agree  
 Black zone ==> Disagree

	January	April	July	October
Job Performance Improvement	3.2	0	0	0
Career Enhancement	2.7	0	0	0
Business Impact	2.6	0	0	0
Organizational Sponsorship & Commitment	2.9	0	0	0
Curriculum Level Measures	2.9	0	0	0
Objective Training Metrics	3.3	0	0	0
Course Delivery / Usability	2.9	0	0	0
e-Learning Effectiveness Index	2.9	0.0	0.0	0.0





<b>Range</b>	The range of a set of numbers is the largest value in the set minus the smallest value in the set. Note that the range is a single number, not many numbers
<b>Measures of center</b>	
<b>Mean</b>	The sum of a list of numbers, divided by the total number of numbers in the list.
<b>Median</b>	Median is the middle piece of data, after you have sorted data from the smallest to the largest. "Middle value" of a list. The smallest number such that at least half the numbers in the list are no greater than it. If the list has an odd number of entries, the median is the middle entry in the list after sorting the list into increasing order. If the list has an even number of entries, the median is equal to the sum of the two middle (after sorting) numbers divided by two.
	The median is the value halfway through the ordered data set, below and above which there lies an equal number of data values. It is generally a good descriptive measure of the location which works well for skewed data, or data with outliers.
<b>Mode</b>	The sample mean is an estimator available for estimating the population mean. It is a measure of location The value that repeats most often. For lists, the mode is the most common (frequent) value. A list can have more than one mode. For histograms, a mode is a relative maximum ("bump"). A data set has no mode when all the numbers appear in the data with the same frequency. A data set has multiple modes when two or more values appear with the same frequency. Modes are often used for so-called qualitative data, that is, data that describes qualities rather than quantities.
<b>Univariate Analysis</b>	Univariate analysis involves the examination across cases of one variable at a time. There are three major characteristics of a single variable that we tend to look at: the distribution, the central tendency, the dispersion In most situations, we would describe all three of these characteristics for each of the variables in our study.
<b>Multivariate analysis:</b>	Multivariate statistics or multivariate statistical analysis in statistics describes a collection of procedures which involve observation and analysis of more than one statistical variable at a time.
<b>t-tests</b>	A t test is any statistical hypothesis test for two groups in which the test statistic has a Student's t distribution if the null hypothesis is true. It is more generally applied to the confidence that can be placed in judgments made from small samples. Among the most frequently used t tests are:
	A test of the null hypothesis that the means of two normally distributed populations are equal. Given two data sets, each characterized by its mean, standard deviation and number of data points, we can use some kind of t test to determine whether the means are distinct, provided that the underlying distributions can be assumed to be normal. All such tests are usually called Student's t tests, though strictly speaking that name should only be used if the variances of the two populations are also assumed to be equal, the form of the test used when this assumption is dropped is sometimes called Welch's t test. There are different versions of the t test depending on whether the two samples are independent of each other (e.g., individuals randomly assigned into two groups), or
<b>MANOVA</b>	Multivariate analysis of variance (MANOVA) methods extend analysis of variance methods to cover cases where there is more than one dependent variable and where the dependent variables cannot simply be combined.



**APPENDIX E**  
**PHASE III – PART B RESEARCH RESULT DOCUMENTS**  
**FROM SUPERVISOR INTERVIEWS**

## Interview Guide

### *e-Learning Effectiveness Index (e-LEI) Scorecard*

#### **A. Purpose:**

Thank you for participating in this research. I'm investigating a procedure to measure an organization's e-learning program effectiveness. Through a procedure called Concept Mapping that was developed by Bill Trochim from Cornell, three stakeholder groups (end-users, performance designers and management) worked with me in identifying Key Performance Criteria (KPC), which could be used to measure how effectively an e-learning program is operating within an organization. Once this was identified, all of the Key Performance Criteria (KPC) was then grouped into seven major categories based on their related attributes that were perceived by the three groups and are called Key Performance Indicators (KPIs). For example, impacting our Business. A survey was then created and can be used by e-learning program managers within an organization to delve down into their e-learning program and receive laser sharp feedback from end-users (See Table 1). All of the survey responses can be captured and correlated (see table 2). The results of the survey can then be converted into an e-learning effectiveness index (e-LEI) scorecard that management can use to track the overall e-learning program effectiveness on a monthly or quarterly basis (See Table 3). At the end of this document is a series of questions about the survey that we would like you to answer through a telephone interview that should last approximately 30 minutes. Brian Petersen (949) 348-3878 will contact you to arrange the interview at your convenience. Your feedback will provide us with information on how we could improve this instrument. Thank you for your participation.

#### **Table 1: Example of the e-Learning Program Effectiveness Survey**

**Please provide us with information about yourself. No names please, survey results are anonymous.**

Gender       Male    Female      Job function \_\_\_\_\_

Months on the job with the company \_\_\_\_\_

Total years in this specific job function at any company \_\_\_\_\_

Total years you have been using e-learning with any company \_\_\_\_\_

Please read each Key Performance Criteria statement in the sections below and then circle a number from 1-4 to rate the criteria. (1=lowest and 4=highest)	Disagree	Somewhat Disagree	Somewhat Agree	Agree	Not Applicable
<b>Affecting my Job Performance.</b>					
My on-the-job performance has improved from training.	1	2	3	4	NA
I am able to use the new knowledge from my e-learning training in my job.	1	2	3	4	NA
My performance as an associate has improved due to the learning I acquired from our e-learning program.	1	2	3	4	NA
The number of skills I can transfer to my job has increased due to my e-learning training that I have taken.	1	2	3	4	NA
I have learned information relevant to current projects and projects planned for the future from our e-learning program.	1	2	3	4	NA
I have acquired new skills and received knowledge faster from our e-learning program.	1	2	3	4	NA
<b>Enhancing my Career.</b>					
My e-learning training has assisted my growth and career development.	1	2	3	4	NA
My e-learning training has supported me in assisting in the strategic business direction of our company.	1	2	3	4	NA
My communication skills have improved through the use of our e-learning programs.	1	2	3	4	NA
I have benefited from this training provided by e-learning.	1	2	3	4	NA
The company's recruiting ability has improved due to our e-learning programs.	1	2	3	4	NA
<b>Impacting our Business.</b>					
The servicing of my internal customers has improved as an outcome of the e-learning training I have taken.	1	2	3	4	NA
My core competencies levels for my job performance have improved because of our e-learning program.	1	2	3	4	NA
Our company's overall organizational performance has improved due to our e-learning programs that are available.	1	2	3	4	NA
I have felt my overall satisfaction and job morale increased	1	2	3	4	NA

due to our e-learning program.					
Our company's profitability has grown as an outcome of our e-learning program.	1	2	3	4	NA
Best practices and new technology training has been delivered as required through the use of our e-learning programs.	1	2	3	4	NA
<b>Determining Organizational Sponsorship and Commitment.</b>					
Management has encouraged me to take training at work.	1	2	3	4	NA
Management has been more supportive of my work after taking e-learning training for my job.	1	2	3	4	NA
A learning environment has been fostered at our company.	1	2	3	4	NA
Learning has been integrated with the performance review process.	1	2	3	4	NA
Supervisors have been able to observe my learning progress through our e-learning system.	1	2	3	4	NA
My training records are available for review and management.	1	2	3	4	NA
<b>Measuring e-Learning Curriculum.</b>					
I found course navigation from screen to screen has been easy in the e-learning training.	1	2	3	4	NA
This e-learning training is "Just-in-time" for my job needs.	1	2	3	4	NA
This e-learning training has been interesting and has kept my attention.	1	2	3	4	NA
Access to the e-learning training has been easy.	1	2	3	4	NA
The modular structure of our e-learning training has allowed each course to build on another.	1	2	3	4	NA
This e-learning training has accommodated multiple learning styles.	1	2	3	4	NA
<b>Quantifying Training Metrics.</b>					
The e-learning courses contain measurable learning objectives.	1	2	3	4	NA
My performance has improved from the pre-course to the post-course when I take e-learning training.	1	2	3	4	NA
My cost for travel associated with training has been reduced.	1	2	3	4	NA

Time lost from work for training travel has decreased due to our e-learning programs.	1	2	3	4	NA
My course material costs were less with this e-learning training.	1	2	3	4	NA
My time required to take new required training has been reduced by having our e-learning program.	1	2	3	4	NA
<b>Appraising Course Delivery / Usability.</b>					
The e-learning program has current business updates incorporated into all training delivered.	1	2	3	4	NA
The e-learning delivery system performed and was reliable.	1	2	3	4	NA
My learner's satisfaction level has increased due to our e-learning program.	1	2	3	4	NA
Our e-learning program provides a broad range of course topics to meet my current learning needs.	1	2	3	4	NA
My learning tracks have been clearly defined within the learning system.	1	2	3	4	NA
Learning has been fun - an enjoyable work activity.	1	2	3	4	NA

### Part B: Example of an e-Learning Program Effectiveness Survey Sample Results

Collated survey results:

Gender      59% Male    41% Female      Job function    Customer Service in US division  
Months on the job with the company      average 21 months  
Total years in this specific job function at any company      average 4.5 years  
Total years they have been using e-learning with any company      average 3 years

Results of survey with 1=lowest and 4=highest. Responses to survey 247 with 235 passing scores and 15 failing scores.	Strongly Disagree	Disagree	Agree	Strongly Agree	Doesn't Apply	Summary Notes
<b>KPI: Affecting my job performance.</b>						
My on-the-job performance has improved.	3%	12%	36%	49%	0%	Good - Performance improved.
I am able to use the new knowledge in my job.	1%	9%	72%	12%	6%	Good – Usable new knowledge.
My performance as an associate has improved.	7%	31%	46%	10%	6%	OK – but job descp poss. unclear.
The number of skills I can transfer to my job has increased.	11%	22%	23%	7%	37%	Measure needs to be evaluated.
I have learned information relevant to current projects and projects planned for the future.	0%	8%	42%	48%	2%	Good – Relevant project info.
I have acquired new skills and knowledge faster.	5%	18%	56%	20%	1%	Good – Acquisition faster.
<b>KPI: Enhancing my career.</b>						
The training has assisted my growth and career development.	1%	2%	71%	4%	22%	OK – but career dev poss unclear
My strategic business direction has been supported.	1%	2%	10%	2%	85%	Measure needs to be evaluated.
My work communication skills have improved.	4%	5%	30%	51%	10%	Good – Work skills improved.
I have benefited from this training.	0%	2%	7%	91%	0%	Excellent – Benefited from training
The company's recruiting ability has improved.	0%	0%	0%	0%	100%	Measure not good for audience.
<b>KPI: Impacting our business.</b>						

KPI: Determining organizational sponsorship and commitment.
KPI: Measuring e-learning curriculum.
KPI: Quantifying training metrics.
KPI: Course Delivery/Usability.

### C. QUESTIONNAIRE

#### Learning Managers/Supervisors:

Based on what you have learned about the *e-Learning Program Effectiveness* process, surveys and scorecard, I would like to interview you and have you respond to the following questions. If you require additional insight into the process, I will answer any questions.

The purpose of the interview is to assist me in my research to determine if the e-Learning Program Effectiveness Scorecard in your opinion is a practical and useful approach that could be used to help organizations measure and then make better decisions on how to improve and manage their existing e-learning programs based on feedback from their employees. Your personnel information will be kept confidential.

#### Questionnaire:

##### PART A:

1. How many employees does your organization have?
2. How long has your e-Learning program been in existence?

3. Do you use an LMS?
4. Do you use an LCMS?
5. Approximately how many end-users in your organization use e-learning for their jobs?
6. How applicable is this tool to your learning environment?
7. Does your organization have established performance criteria that are used to measure your e-learning programs effectiveness?
8. If YES to question 7, can you explain what the performance criteria are?
9. If YES to question 7, how often is the e-learning program being measured for its overall effectiveness?
10. Are you presently satisfied with how your e-learning program's effectiveness is measured?

**PART B:**

1. How effective do you think the e-LEI scorecard would be in assisting your organization in measuring your e-learning program's effectiveness?
2. Do you think the Key Performance Criteria (KPCs) that was identified by three different stakeholder groups during Concept Mapping, are the right types of criteria to measure against?
3. In your opinion were the stated performance criteria in the survey enough to build an e-learning scorecard for?
  - Job Performance       Yes    No      ➤ Curriculum Adequacy       Yes    No
  - Career Enhancement       Yes    No      ➤ Training Metrics       Yes    No
  - Business Impact       Yes    No      ➤ Course Delivery/Usability       Yes    No
  - Organizational Sponsorship       Yes    No



4. Did the survey data provide the feedback required to target problems with the e-learning in terms of?

- Meeting business Objectives       Yes    No
- Program Effectiveness       Yes    No
- Transfer of New Knowledge       Yes    No
- Practice of New Skills       Yes    No
- Performance of Goals       Yes    No
- Up to Date Courseware       Yes    No

5. Would the sample survey result data be able to highlight any improvements that are required to an e-learning program?
6. Do you have any comments or suggestions for improvement of the e-Learning Program Effectiveness process, tools and

Scorecard?

*Thanks so much for your time. Brian Petersen*

**Supervisor Interview # 1 (Un-edited Version)**  
**e-Learning Effectiveness Index (e-LEI) Scorecard**

**Questionnaire:**

PART A: Interviewee: Manager of External Client e-Learning Programs: Male –  
Conducted with Hewitt Associates on Feb 12, 2007

1. **How many employees does your organization have?**  
About 20,000 employees.
2. **How long has your e-Learning program been in existence?**  
Not entirely sure but suspect at least 5 to 6 years in existence.
3. **Do you use an LMS?**  
Yes.
4. **Do you use an LCMS?**  
No they do not use one.
5. **Approximately how many end-users in your organization use e-learning for their jobs?**  
I would have to say that he is unsure with this.
6. **How applicable is this tool to your learning environment?**  
Um you know I think that once I had clarification of what you were looking for me to answer from, it would make it a lot easier. Um, in other words, as I took it as what I do professionally, for the organization I was a little unsure of how I was suppose to be rating it. I did rate it um, based on my experience with Hewitt. So you know again some of the responses seem low but my experience with them has been um a little over a year. Um and I have not had the opportunity to take myself a lot of Hewitt's e-learning programs.
7. **Does your organization have established performance criteria that are used to measure your e-learning programs effectiveness?**  
Again Brian I'm not sure, as my job is not responsible for the internal population but rather the external client population. Um, I will say that it appears from my review of some of the courses, it tends to be training that is geared around more soft skills or um, um office software skills. They have some advanced programming courses. But it tends to be things around leadership development situational, um, leadership type programs. Um there are some basic HR courses in terms of how you enter in your time, and manage things from that perspective. So from what I have been able to see, more focused on HR related items and kinda soft skill training with the supplement with more MS Office type of things like Word™ and Excel™. And less emphasis on more job specific skill training. In terms of measurement yes it is. Um, but again I don't see much of that data so it is difficult for me to say how much Hewitt Learning managers are using that information. Um, you know, there are assessments, um there are you know various performance measurement tools we use to measure employee performance. Um so, I would suspect that we are using that data for this purpose. I would hope that we would be.
8. **If YES to question 7, can you explain what the performance criteria are?**  
Metrics coming from our LMS for the most part.

9. **If YES to question 7, how often is the e-learning program being measured for its overall effectiveness?**

We collect data periodically, um like every quarter.

10. **Are you presently satisfied with how your e-learning program's effectiveness is measured?**

I think it needs to be improved and expanded upon and I know we are looking into this.

**PART B:**

11. **How effective do you think the e-LEI scorecard would be in assisting your organization in measuring your e-learning program's effectiveness?**

What level would you see this going to Brian? <Brian> The actual end-users. <stop Brian>, Ok, ok I got you. Ah, I think it could be pretty effective. Um, I am just going back through some of the categories here. Yea, I think from actually the person taking the course, there are obviously various areas that would be relevant such as "affecting job performance", "advancing my career". Um, depending upon the level of the person the "impact on the business", um, I like the situational and contextual focus with "determining organizational sponsorship and commitment". Um, I would be curious under the KPI "determining organizational support", if there would be some sort of question around the amount of time, do people feel if they had an adequate amount of time, to take the training. In other words, management could be supportive of you to take the training in words, but do they actually provide the opportunity? Um, that would be an area where I can see a need. Um, as well as you know, are there, I don't know how to phrase this? Basically, the environment you are talking about, for example you refer to "a learning environment has been foster at our company.." um, kind subsequent to that, it seems to me there would be a question around "do I have an adequate environment in which to, you know to take the training?" In other words, you know are people taking training at their desks' in their learning environment with so many distractions and things going on. Or, ya know are they being given the opportunity to get to a lab or other types of situations where they could remove themselves from work environment. Um, you know that might provide some insight in terms of the overall effectiveness of the program.

12. **Do you think the Key Performance Criteria (KPC's) that was identified by three different stakeholder groups during Concept Mapping, are the right types of criteria to measure against?**

And Brian is that the brainstorming approach? <Brian> No it is the actual survey <stop>. Ok, I got ya! I see. Um, yea I think so. Obviously, I have given you some thoughts on additional things. Um, I think so! One question I was not sure about had to do about the recruiting piece? <Brian> What that KPC means is by having an e-learning program working in your organization, does that help bring in new employees as it could be seen or perceived as a value add? <end>. Got you, ok.

13. **In your opinion were the stated performance criteria in the survey enough to build an e-learning scorecard for?**

- |                              |                           |                          |
|------------------------------|---------------------------|--------------------------|
| ➤ Job Performance            | <input type="radio"/> Yes | <input type="radio"/> No |
| ➤ Career Enhancement         | <input type="radio"/> Yes | <input type="radio"/> No |
| ➤ Business Impact            | <input type="radio"/> Yes | <input type="radio"/> No |
| ➤ Organizational Sponsorship | <input type="radio"/> Yes | <input type="radio"/> No |

- Curriculum Adequacy                       Yes    No
  - Training Metrics                               Yes    No
  - Course Delivery/Usability                   Yes    No
14. **Did the survey data provide the feedback required to target problems with the e-learning in terms of?**
- 1. Meeting Business Objectives    Yes    No
  - 2. Program Effectiveness             Yes    No
  - 3. Transfer of New Knowledge        Yes    No
  - 4. Practice of New Skills                Yes    No
  - 5. Performance Goals                   Yes    No
  - 6. Up-to-Date courseware            Yes    No
15. **Would the sample survey result data be able to indicate any improvements that are required to an e-learning program?**

Well how the data would be useful to me is if I took, basically this is um data based on how a person perceives things. If I could match this up with actual performance data, then I think this could be very, very beneficial! Um, I think where I would find it very useful is how the organization views this particular mechanism, as an effective way to train people. So it is almost giving you a sense of an organizational perspective. You know when you look at these numbers in aggregate. Um to say you know what, the organization feels this is a good mechanism for training. It is meeting the needs. Obviously there is a lot of other data that would have to go along with this. I think to help it. For example, like I said I could look at um let's say that I was doing this on a particular business unit. If I could see that a person's on-the-job performance has improved they were able to use their new knowledge on the job and I could correlate that or see actual performance of my team improving then that would give me support. Not only is their perception accurate but their actual performance is accurate. Cause someone could feel good about it...Hey, I had a great training experience, ya, I feel like it helped me, but then you see very little change in actual performance. And that actually gets to whether or not either it was effective in doing what it needed to do, or um you know it might have been good at near transfer so they were able to answer those kind of questions relevant to the e-learning program. But, it wasn't a good communicator of far transfer. In other words, their ability to transfer that knowledge into a more ill structure environment which most business environments are. So being able to use actual performance data in conjunction with these types of surveys, I think provides good insight. You know, similarly looking at lower ratings, to me it is an indicator of how the organization views not only training as an effective means of accomplishing performance objectives, but also getting a sense of you know maybe there are certain groups that need more help in migrating from traditional methods of instruction to um, a you know more electronic means of instruction. So to me it gives me, based on what I'm looking at um, and where I may see issues um you know it may give me some great insight you know such as where I need to devote some attention, and maybe focus on some change management strategies as well as um maybe implementation strategies cause maybe we are starting to find out that things are not easy or we start to see that people don't feel that they are supported by management (KPC), for training. As a manager I may be thinking well why is that? We have all of these e-learning programs out there; obviously people are not taking them? Well that tells me that I can do something with that information now. I can measure from

quarter to quarter or however I want to set my measurement cycles up. (For example), If I'm doing actions with this programs maybe I need to market these programs more effectively. Um, then I may be able to see improvements in that field of support. So I think it can provide a variety of different inside information based on what trends I'm seeing either positive or negative. It provides you with a dashboard to get "indications" of areas that are being perceived as successful and areas that are being perceived as not being very successful. If you understand these points then it puts you in a position to peel the onion back and to really find out more information about what the problem may be. Cause for example, in my situation I have just not had the opportunity to take a lot of courses, instructor-led or e-learning. So you know my ratings are lower cause I don't have a lot to base it on. You know my e-learning experience has been on you know the time entry system. Um, and compliance course which are always boring, just the content itself. I had the instructor-led training in Charlotte which you also attended. Um, so that has been my training with time entry than anything else. So you know as a manager I would look at this and say "why does a person not feel like they have time to do training or not feel like their supported?" so it gives me information to go back and then try to understand more. (Example) Has the training assisted my career growth and development? Well based I what I just told you it has been very minimal. Um, one class out of three opportunities that I just had. And getting back to the initial question I think it does. It proves what is going well. Um and it gives us something to measure against and something to set targets against. So okay you know, it is 10 percent (on a KPI) in the beginning of January, um you know, let's see if we can have 5 to 10 percent growth you know each quarter. And so our goal is to be at 20 or 25 percent by the end of the year. Because we know we can't immediately upgrade the entire infrastructure or whatever the situation may be. Um you know again what I think is data is just that... its information. It really depends on how we use the information and I think the more concise we can present the information in a way that is usable for people, the better it is going to be received and actually used.

**16. Do you have any comments or suggestions for improvement of the e-Learning Program Effectiveness process, tools and scorecard?**

One of the things there may be ways if you want to and I know this may be difficult sometimes, if you were to look at certain individual organizational factors, maybe doing an exercise with some of the organizations to modify it (e-LEI) a little bit based on that particular culture or whatever. Um, that might give you some additional insight. Um, all in all, it kind of gets to some of the points that are important in managing the e-learning side of things. Um, I'm just kinda going back through here. Nothing else than that I have really suggested up to this point.

*Thanks so much for your time. Your responses enable me to improve my research.*

**Supervisor Interview #2 (Un-Edited Version)**  
**e-Learning Effectiveness Index (e-LEI) Scorecard**

**Questionnaire:**

PART A: Interviewee Manager of e-Learning program. Female – Conducted with Enspire Learning Feb on 20, 2007

**1 How many employees does your organization have?**

About 60

**2 How long has your e-Learning program been in existence?**

The answer is 3 years.

**3 Do you use an LMS?**

We have built one that we use to host and deploy e-learning courses to our staff.

**4 Do you use an LCMS?**

No.

**5 Approximately how many end-users in your organization use e-learning for their jobs?**

Yes that's correct, there, are some in terms of ... both synchronous delivery ... Ah, that we've participated in and some other asynchronous programs, which mainly, are about the tools we use in our work.... I would say a quarter or roughly 20 employees.

**6 How applicable is this tool to your learning environment?**

Overall, I think the tool would be very help full, um in fact, actually in evaluating any training initiative. So it wouldn't necessarily be applicable only to an e-learning or a series of e-learning programs, but it could be applied to an entire ah, training initiative of sort. So yes its applicable tool.

**7 Does your organization have established performance criteria that are used to measure your e-learning programs effectiveness?**

Mostly in pre and post survey types of assessments. It's more a smile sheet. And some knowledge assessments that are usually done by the e-learning course /program itself.

**8 If YES to question 7, can you explain what the performance criteria are?**

Um, well the questions are normally associated with what the generic smile sheets there more in terms of. Like how you feel the learning might be applicable to your work performance. If you feel like um, it's whatever area of study that might be um, feel more capable of, discourse on that subject or using that subject and questions about um, do you feel confident to use this on your job? Um, ah, do you feel, you know? Would you recommend this to a colleague? Ah, did this meet your expectations? You know, it kind of ah, some specific and some general criteria too.

**9 If YES to question 7, how often is the e-learning program being measured for its overall effectiveness?**

No not necessarily, but we have developed a measurement and evaluation system for ourselves that work off these smile sheets and it's really up to the program manager if they want to do the smile sheets or not after an e-learning event.

**10 Are you presently satisfied with how your e-learning program's effectiveness is measured?**

Probably the answer is no. Simply because beyond the smiles we haven't done a lot of correlation between, lets say what was the actual performance in the training program and what did the individual survey reveal and follow it with a manager survey or a post-survey follow-up 30-60 days after training to verify retention and use (application). So in terms of measurement, it's all happening at different times of e-learning delivery.

**PART B:**

**11 How effective do you think the e-LEI scorecard would be in assisting your organization in measuring your e-learning program's effectiveness?**

Great question! I think it as a perception based instrument, so mainly in the collection of opinions and attitudes. You know I would want to balance that and get facts that I might get from other data sources. Like the number of people that are taking it, the completion rate, what the managers are saying, and post training effects. I think as far as a perception level evaluation it is very thorough.

**12 Do you think the Key Performance Criteria (KPC's) that was identified by three different stakeholder groups during Concept Mapping, are the right types of criteria to measure against?**

Yes absolutely! I think it is one of the more thorough evaluation pieces I have ever seen, in terms of the broad range of measurable effects. Beyond just "affects my job performance" it dove into "career enhancement" and "business impact" and the "organizational sponsorship", all of those are important performance indicators. Your stakeholder groups used in the study in my opinion were right on target.

**13 In your opinion were the stated performance criteria in the survey enough to build an e-learning scorecard for?**

- |                              |                       |                             |                       |
|------------------------------|-----------------------|-----------------------------|-----------------------|
| ➤ Job Performance            | <input type="radio"/> | ➤ Curriculum Adequacy       | <input type="radio"/> |
| Yes                          | <input type="radio"/> | Yes                         | <input type="radio"/> |
| No                           |                       | No                          |                       |
| ➤ Career Enhancement         |                       | ➤ Training Metrics          | <input type="radio"/> |
| Yes                          | <input type="radio"/> | Yes                         | <input type="radio"/> |
| No                           |                       | No                          |                       |
| ➤ Business Impact            |                       | ➤ Course Delivery/Usability | <input type="radio"/> |
| Yes                          | <input type="radio"/> | Yes                         | <input type="radio"/> |
| No                           |                       | No                          |                       |
| ➤ Organizational Sponsorship |                       |                             |                       |
| Yes                          | <input type="radio"/> |                             |                       |
| No                           |                       |                             |                       |

**13 Did the survey data provide the feedback required to target problems with the e-learning in terms of?**

- |                             |                       |                       |                       |
|-----------------------------|-----------------------|-----------------------|-----------------------|
| Meeting business Objectives | <input type="radio"/> | Up to Date Courseware | <input type="radio"/> |
| Yes                         | <input type="radio"/> | Yes                   | <input type="radio"/> |
| No                          |                       | No                    |                       |
| Program Effectiveness       |                       |                       |                       |
| Yes                         | <input type="radio"/> |                       |                       |
| No                          |                       |                       |                       |
| Transfer of New Knowledge   |                       |                       |                       |
| Yes                         | <input type="radio"/> |                       |                       |
| No                          |                       |                       |                       |
| Practice of New Skills      |                       |                       |                       |
| Yes                         | <input type="radio"/> |                       |                       |
| No                          |                       |                       |                       |
| Performance of Goals        |                       |                       |                       |
| Yes                         | <input type="radio"/> |                       |                       |
| No                          |                       |                       |                       |



**14 Would the sample survey result data be able to highlight any improvements that are required to an e-learning program?**

I would particularly agree in measuring the e-learning area and the usability. I would think I would be able to really draw, in terms of being able to pin point improvements in those area. Again, know which courses are being specifically reviewed, then I would know where I might be failing. I also might be able to use the data provide improvements in the job performance (KPI) and to the career enhancement (KPI). Generally, I would think that the “impact of business” (KPI), would give a good sense of what people think about if the e-learning program is truly helping the business. I think I could get some really good data from that section to understand cost issues and what ROI would be coming out of that.

**15 Do you have any comments or suggestions for improvement of the e-Learning Program Effectiveness process, tools and scorecard?**

First thought is I think you have done a fabulous methodology, that I think it is credible. This would make me look at this tool in seriousness. I think it would be interesting to know how you might integrate this tool with a LMS that might be showing some more aggregation of data, so all the people who took this course will sway this way, and people who took the series of courses actually are performing better. I can aggregate the survey with other metrics that I might have within my system already. Same with the scorecard! I might provide some visual indicators along the way, the good and the bad, maybe doing some accumulative pie charts or other types of graphics that program managers might print out and say “ya look at this!” We all love to be able to visualize this and I think on the last page there on the score chart you have a scale there. It would be really interesting to me to have some more visualization tools to go along with this data that was generated. The ability to generate this data is so valuable to us! And again, the other thing I might say is, have the ability for whomever will be using this, to add on questions of their own so they can actually be doing some more specific targeted questions that might be around specific business objectives or other specific performance criteria’s that they might want to measure. Last thing I might say in delivery of the survey, there needs to be “like your questionnaire to me”, you had a nice purpose. But in your survey statement you write “participant, please provide use information about yourself” I think you should say something about “why this survey is important”. I would want, not a long sentence or anything like that, but say “your opinion matters”. “This affects our company”, “please take the time”, “you’re valued”, “you’re appreciated”, “this has impact”, “you have impact”, “hooray!” It’s always nice that there is some type of incentive on the back end for people, I think of anytime you can think of ways that is proof that you care then people are not going through the survey and going check, check, check, check. Anything that will give them more mindfulness will get them more engaged. This shows them that their really providing value and that and that they might receive something of value back, even if it is some e-mail or a kick back coming from the system going to them. Many times we are faced with so many questionnaires and the thing is that we don’t take them seriously and then we might be hap-hazard with them. And the last thing, just in the front part of the survey regarding the gender and job function in total years, months with company, total years months on the job, and total months using e-learning. I would want all of those measures to be on the same

measurement frequency. Sometimes we are talking about month or years. I would want them to report a year and month for each of those. I think that is it. Thanks.

***Thanks so much for your time. Your responses enable us to improve my research.***

**Supervisor Interview #3 (Un-Edited Version)**  
**e-Learning Effectiveness Index (e-LEI) Scorecard**

**Questionnaire:**

PART A: Interviewee: Director e-Learning - Male – Conducted with Maximize Learning on Feb 22, 2007

**1 How many employees does your organization have?**

About 4,000

**2 How long has your e-Learning program been in existence?**

Approximately 3 years.

**3 Do you use an LMS?**

We use the SumTotal system

**4 Do you use an LCMS?**

Yes we have it as part of the SumTotal system but we do not actively use it for managing learning objects.

**5 Approximately how many end-users in your organization use e-learning for their jobs?**

We keep track of this and I do have the exact data, but not in front of me, but I know we have a usage rate of 100% but at different participation levels as you might expect.

**6 How applicable is this tool to your learning environment?**

I think the e-LEI scorecard as you call it can be a valuable to gain end-user reactions and um...perceptions about our programs.

**7 Does your organization have established performance criteria that are used to measure your e-learning programs effectiveness?**

We have established performance criteria that we established with stakeholders in our organization to understand how well our programs are working.

**8 If YES to question 7, can you explain what the performance criteria are?**

The majority of the data is collected through our LMS system and pertains to a large extent on end-user data. Data like, number of users per month, time on courses, course completions, success on knowledge assessments, e-learning course satisfaction reviews, cost per course to deliver, etc. We have developed monthly reports so that we can report out to executive management on um...metrics that are meaningful.

Really a dashboard of key metrics of interest to our firm.

**9 If YES to question 7, how often is the e-learning program being measured for its overall effectiveness?**

We collect and report out on the data every month and we can create whatever reports we need since we pull the data from a database and use a business intelligence software package to manipulate the data as we require.

**10 Are you presently satisfied with how your e-learning program's effectiveness is measured?**

Yes but with more to be said. I am always looking for how we could perform the role as learning leaders better. I feel that we as learning practitioners don't have a really good grasp of the type of information that we really need. e-Learning is still fairly young in terms of being deployed effectively and we are trying to understand this and grow.

**PART B:**

**11 How effective do you think the e-LEI scorecard would be in assisting your organization in measuring your e-learning program's effectiveness?**

Um! What I like about your tool is that it measures many different aspects of a...program. It is perception focused but I value the perceptions of our users. Also, I really like the idea that the survey was developed using managers, end-users and training developers because I know they view things differently among what is important and what is not. I think we would include this survey as part of other metrics we already collect now.

**12 Do you think the Key Performance Criteria (KPC's) that was identified by three different stakeholder groups during Concept Mapping, are the right types of criteria to measure against?**

Uh, as I said in my previous answer to your question, I think these... what you call performance criteria should be a part of a comprehensive evaluation system of how effective our e-learning program is running. Combining your survey information with our existing data coming from our LMS can be a powerful way of understanding what is working and what isn't.

**13 In your opinion were the stated performance criteria in the survey enough to build an e-learning scorecard for?**

- |                              |   |                             |
|------------------------------|---|-----------------------------|
| ➤ Job Performance            | ○ | ➤ Curriculum Adequacy       |
| Yes ○ No                     |   | Yes ○ No                    |
| ➤ Career Enhancement         |   | ➤ Training Metrics          |
| ○ Yes ○ No                   |   | Yes ○ No                    |
| ➤ Business Impact            |   | ➤ Course Delivery/Usability |
| ○ Yes ○ No                   |   | Yes ○ No                    |
| ➤ Organizational Sponsorship |   |                             |
| ○ Yes ○ No                   |   |                             |

**14 Did the survey data provide the feedback required to target problems with the e-learning in terms of?**

- 17. Meeting business Objectives  
    ○ Yes ○ No
- 18. Program Effectiveness  
    ○ Yes ○ No
- 19. Transfer of New Knowledge  
    ○ Yes ○ No
- 20. Practice of New Skills  
    Yes ○ No
- 5. Performance of Goals  
    Yes ○ No
- 6. Up to Date Courseware  
    Yes ○ No

**15 Would the sample survey result data be able to indicate any improvements that are required to an e-learning program?**

Perception is reality as I think someone once said. So if the survey has been administered properly and you get enough feedback from a sample group, then I believe that these responses are good “indicators” of how employees feel the e-learning program is being delivered. The scorecard is critical to inform management what is perceived by the population, um...to what is working or not working well. If our training team knows at a high level what is not working, we can perform additional investigation with the concerned parties to find out the root cause of the perceived and I say perceived problem, then we would be in a better position to adjust and make corrections. I don't think we would measure every month or um maybe if it was a different sample group, but probably every quarter with different end-users and managers.

**16 Do you have any comments or suggestions for improvement of the e-Learning Program Effectiveness process, tools and scorecard?**

Brian a couple of things come to mind. You definitely got the process right in tying e-learning performance results linked to business goals, so that is fine. Also, how you went about collecting different perspectives from different groups like managers, and trainers is a good approach. Where I think you could further improve the tool is in the survey itself. The wording that is used in your criteria could be refined further and I think that will occur as the survey tool is deployed more and you get feedback on this. Also, you might include a part of the survey that would allow for the respondent to um, um be able to give feedback on something that is not included in the tool but they feel is important to speak about. I not sure how you could do this but if you could put weights to each performance d=criteria and even monetary values of some sort and I'm not sure how but a, um...then this could be a powerful tool as part of measuring the e-learning program and its delivery effectiveness. Thanks for including me in this interview.

*Thanks so much for your time. Your responses enable me to improve my research.*

**Summary Results of Supervisor Interviews  
Compiled (Edited) Results  
E-Learning Effectiveness Index (e-LEI) Scorecard**

**PART A:**

**How many employees does your organization have?**

- Hewitt Associates: 20,000 employees worldwide
- Enspire Learning: 62 employees
- Maximize Learning: About 4,000 on three continents

**How long has your e-Learning program been in existence?**

- Approximately 6 years
- A couple of years
- Approximately 3 years.

**Do you use an LMS?**

- SumTotal LMS
- We have developed a proprietary system
- We use the SumTotal system

**Do you use an LCMS?**

- Yes we have a SumTotal LCMS
- No
- Yes we have it as part of the SumTotal system but we do not actively use it for managing learning objects.

**Approximately how many end-users in your organization use e-learning for their jobs?**

- Approximately 50%
- 20 employees
- A usage rate of 100% but at different participation levels.

**How applicable is this tool to your learning environment?**

- I feel the organization might be a little uncertain how they are suppose to rate the performance criteria in our environment
- Overall, the tool would be very helpful, actually in evaluating any training initiative.
- I think the e-LEI scorecard as you call it can be a valuable to gain end-user reactions and um...perceptions about our programs.

**Does your organization have established performance criteria that are used to measure your e-learning programs effectiveness?**

- In terms of measurement yes we have it. They use assessments and various performance measurement tools to measure employee performance.
- Mostly in the form of pre and post survey types of assessments. More of a smile sheet evaluation.
- Yes - performance criteria has been established with stakeholders in our organization.

**If YES to the last question, can you explain what the performance criteria are?**

- Metrics coming from the Learning Management System (LMS).
- This includes such questions as:
  1. Feel more capable at what you do?

2. Discourse on the subject material?
  3. Confident now to use on your job?
  4. Do you feel you know the subject material?
  5. Did it meet your expectations?
- Data is collected through our LMS system and pertains to a large extent on end-user data. Data such as;
- i. number of users per month,
  - ii. time on courses,
  - iii. course completions,
  - iv. success on knowledge assessments,
  - v. e-learning course satisfaction reviews,
  - vi. Cost per course to deliver.
  - vii. We have developed monthly reports so that we can report out to executive management. Metrics that is meaningful. Really a dashboard of key metrics of interest to our firm.

**If YES to question, how often is the e-learning program being measured for its overall effectiveness?**

1. On a quarterly basis.
2. They have developed a measurement and evaluation system that works from the smile sheet data.
3. Collect and report out on the data every month and we can create whatever reports we need since we pull the data from a database and use a business intelligence software package to manipulate the data as we require.

**Are you presently satisfied with how your e-learning program's effectiveness is measured?**

- Needs to be improved and expanded upon.
- No. Simply because they have not done a lot of correlation between what was the actual performance in the training program and what did the individual survey reveal.
- They always look for how we could perform the role as learning leaders better. Learning practitioners don't have a really good grasp of the type of information that we really need. E-Learning is still fairly young in terms of being deployed effectively and we are trying to understand this and grow.

**PART B:**

**How effective do you think the e-LEI scorecard would be in assisting your organization in measuring your e-learning program's effectiveness?**

1. Could be pretty effective.
2. The e-learning effectiveness index is a perception based instrument so it could be used to collect opinions and attitudes. Should balance that with our sources of data, such as the number of people taking courses, completion rates, and post-training effects. As far as perception level evaluation it is very thorough.
3. What I like about your tool is that it measures many different aspects of a program. It is perception focused, but I value the perceptions of our users. Also, I really like the idea that the survey was developed using managers, end-users and training developers because I know they view things

differently among what is important and what is not. I think we would include this survey as part of other metrics we already collect now.

**Do you think the Key Performance Criteria (KPC's) that was identified by three different stakeholder groups during Concept Mapping, are the right types of criteria to measure against?**

1. I think so.
2. Yes absolutely! It is one of the more thorough evaluation pieces in terms of a broad ranged of measurable effects. The stakeholder groups used in this research were right on target.
3. The performance criteria should be a part of a comprehensive evaluation system of how effective our e-learning program is running. Combining your survey information with our existing data coming from our LMS can be a powerful way of understanding what is working and what isn't.

**In your opinion were the stated performance criteria in the survey enough to build an e-learning scorecard for?**

(Number by Yes or No indicates the response made by the 3 e-learning supervisors)

	Yes	No	Both
> Job Performance	3		
> Career Enhancement	3		
> Business Impact	3		
> Organizational Sponsorship	3		
> Curriculum Adequacy	2		1
> Training Metrics	2	1	
> Course Delivery/Usability	3		

**Did the survey data provide the feedback required to target problems with the e-learning in terms of?**

	Yes	No	Both
> Meeting business Objectives	3		
> Program Effectiveness	3		
> Transfer of New Knowledge		3	
> Practice of New Skills	1	2	
> Performance of Goals	3		
> Up to Date Courseware	3		

**Would the sample survey result data be able to indicate any improvements that are required to an e-learning program?**

1. The data would be useful based on how a person perceives things. You could match this up with actual performance data and this could be very, very beneficial! It gives you a sense of an organizational perspective when you look at the numbers in aggregate. Obviously, there is a lot of other data that would go along with this. To be able to use actual performance data in conjunction with these types of surveys provides good insight, such as where one needs to devote



some attention towards. It provides you with a dashboard to get “indications” of areas that are being perceived as successful and areas that are being perceived as not being successful. It puts you in a position to peel the onion back and really find out more information of where the problem might be. It provides you with something to measure against and something to set targets against.

2. I would particularly agree in measuring the e-learning delivery and usability. Also, really good data from “impact of business” (KPI) in terms of understanding cost issues and what ROI would be coming out of that.
3. Perception is reality. If the survey has been administered properly and you get enough feedback from a sample group, then I believe that these responses are good “indicators” of how employees feel the e-learning program is being delivered. The scorecard is critical to inform management what is perceived by the population, to what is working or not working well. If our training team knows at a high level what is not working, we can perform additional investigation with the concerned parties to find out the root cause of the perceived and I say perceived problem, then we would be in a better position to adjust and make corrections.

**Do you have any comments or suggestions for improvement of the e-Learning Program Effectiveness process, tools and scorecard?**

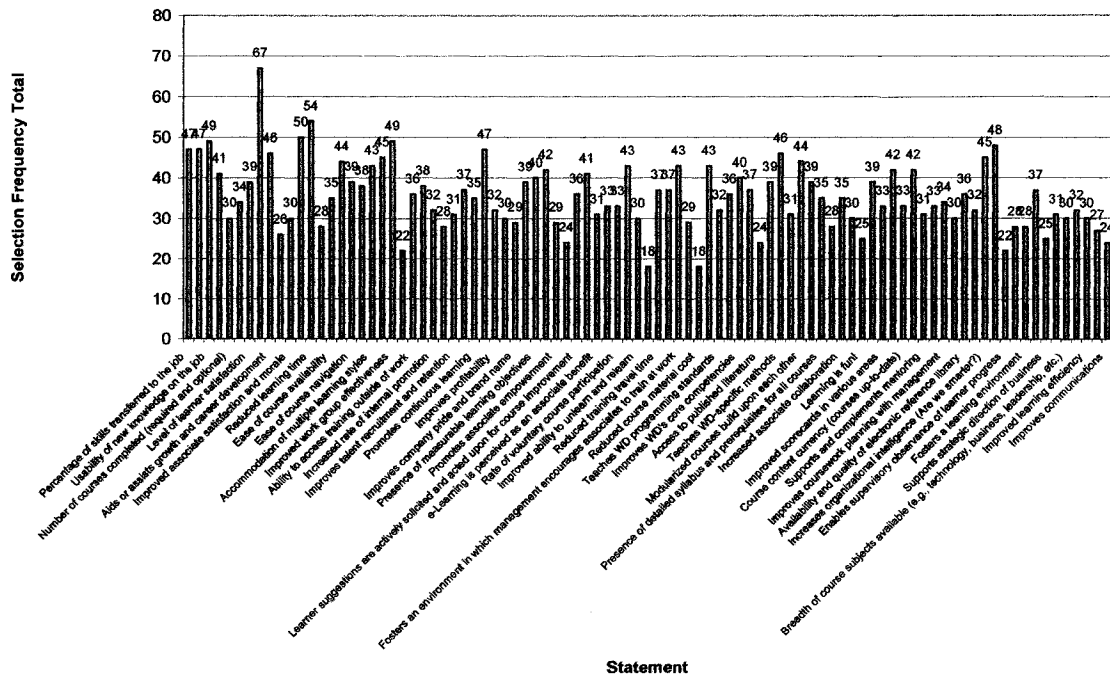
1. Maybe looking at organizational factors and modifying the e-Learning Effectiveness Index based on that organization’s culture. It does get to some of the points that are important in managing the e-learning side of training.
2. First, I think is a fabulous methodology that is credible. This makes me look at the tool in seriousness. You would want to integrate the tool with LMS data. Also, you should use more visual indicators in your scorecard that a manager could print out and say “ya look at this!” Also, allow the e-learning manager to add one question of their own such as a specific business objective or other KPC that they might want to measure.
3. You definitely got the process right in tying e-learning performance results linked to business goals. Also, how you went about collecting different perspectives from different groups like managers, and trainers is a good approach. Where I think you could further improve the tool is in the survey itself. The wording that is used in your criteria could be refined further and I think that will occur as the survey tool is deployed more and you get feedback on this. Also, you might include a part of the survey that would allow for the respondent to be able to give feedback on something that is not included in the tool but they feel is important to speak about. I not sure how you could do this but if you could put weighs to each performance criteria and even monetary values of some sort then this could be a powerful tool as part of measuring the e-learning program and its delivery effectiveness.

**APPENDIX F**  
**RESEARCH RESULT DOCUMENTS FROM PHASE II**

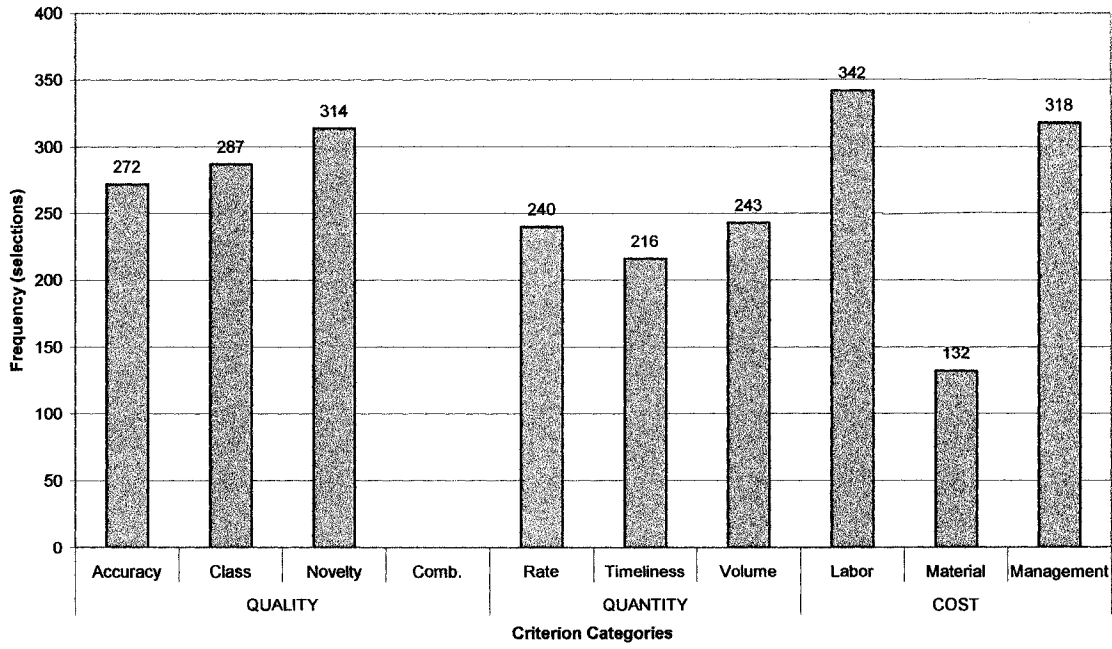
INSTRUCTIONS: For each statement listed, place a "1" in one or more cell if you believe the statement is related to any of the Quality, Quantity, and Cost Measures listed in the columns. A brief explanation of each of the nine measures is included below. If you do not believe the statement can be related to any of the nine measures, leave the cells blank.												
	QUALITY				QUANTITY				COST			TOTALS
	Accuracy	Novelty	Comb.	Rate	Timeliness	Volume	Labor	Material	Management			
Accuracy—the degree to which a criteria matches a model without errors; Class—comparative superiority of criteria;												
Novelty—degree of innovation; Comb—Combination of Accuracy, Class, Novelty; Rate—productivity measure per unit time;												
Timeliness—performance against schedule; Volume—bulk or unit production measures; Labor—Employee time; Material—includes all material costs; Management—includes all supervisory and managerial resources												
<b>EXAMPLE 1: Number of registrations</b>												
<b>EXAMPLE 2: Procedures, instructional management styles</b>		3,20			2,56			2,90				
Percentage of skills transferred to the job	6	3	0	9	9	5	5	6	0	4	47	
Increased use of e-Learning	3	2	8	13	3	1	6	5	3	3	47	
Usability of new knowledge on the job	8	2	1	11	8	3	4	6	2	4	49	
Positive trend in test scores	9	4	2	15	4	1	4	1	0	1	41	
Number of courses completed (required and optional)	0	1	1	2	5	2	10	4	4	1	30	
Number of course registrations	2	0	3	5	4	2	11	2	2	3	34	
Level of learner satisfaction	2	8	3	13	2	1	4	3	1	2	39	
Improved job performance	8	4	3	15	8	9	7	8	1	4	67	
Aids or assists growth and career development	3	4	7	14	4	2	3	5	0	4	46	
Degree of management support	0	2	1	3	1	2	2	1	1	13	26	
Improved associate satisfaction and morale	1	6	1	8	3	2	2	5	0	2	30	
Improved customer service	7	6	4	17	3	5	2	3	0	3	50	
Reduced learning time	4	4	3	11	8	9	4	8	0	3	54	
Number of hits to online course catalog	2	0	5	7	5	2	5	2	0	0	28	
Ease of course availability	4	2	3	9	1	6	2	5	2	1	35	
Ease of course accessibility	4	3	6	13	2	3	2	6	3	2	44	
Ease of course navigation	3	3	5	11	4	5	2	5	1	0	39	
Number of requests for additional courses	3	3	5	11	4	0	5	4	1	2	38	
Accommodation of multiple learning styles	3	5	8	16	0	2	1	4	1	3	43	
Low course abandonment rate	6	3	4	13	6	1	5	3	1	3	45	
Improved work group effectiveness	6	3	3	12	5	5	5	6	0	4	49	
Positive informal feedback (word-of-mouth)	0	4	5	9	2	0	0	1	0	1	22	
Ability to access training outside of work	2	3	7	12	0	2	1	7	1	1	36	
Level of associate participation after-hours	1	3	7	11	3	3	3	6	0	1	38	
Increased rate of internal promotion	1	3	3	7	5	2	2	2	0	7	32	
Courses are short in duration	2	1	0	3	5	5	4	6	0	2	28	
Improves talent recruitment and retention	2	5	1	8	0	0	1	6	2	6	31	
Courses keep learner's attention	2	4	9	15	0	1	0	4	0	2	37	
Promotes continuous learning	1	8	5	14	0	0	2	3	0	2	35	
Improves associate performance	7	4	1	12	4	2	4	9	0	4	47	
Improves profitability	1	1	2	4	4	1	4	6	3	6	32	
Increased sales	1	1	2	4	5	1	8	3	1	4	30	
Improves company pride and brand name	0	6	5	11	1	0	1	1	0	4	28	
Pre-Post course performance improvement	5	2	1	8	5	2	6	4	2	4	38	
Presence of measurable learning objectives	10	4	0	14	2	2	2	2	1	3	40	
Course availability for all levels of learners	6	4	3	13	2	2	3	4	2	3	42	
Promotes associate empowerment	0	5	5	10	1	0	1	3	0	4	29	
Percentage of course evaluations completed	2	1	1	4	6	0	4	4	0	2	24	
Learner suggestions are actively solicited and acted upon for course improvement	1	3	8	12	0	1	1	2	3	5	36	
Reduces associate performance with below-average performance	5	4	0	9	6	4	4	6	0	3	41	
e-Learning is perceived as an associate benefit	0	3	8	11	1	1	1	3	0	3	31	
Improved associate reading skills	6	3	0	9	2	2	4	5	1	1	33	
Rate of voluntary course participation	2	1	6	9	4	1	3	4	2	1	33	
Improved computer usage and skills	7	3	1	11	4	4	4	6	2	1	43	
Improved ability to unlearn and relearn	2	3	3	8	2	4	2	4	0	2	30	
Reduces information overload	2	2	2	6	0	0	2	3	0	1	18	
Reduced training travel time	2	2	1	5	3	4	1	10	3	6	37	
Reduced training travel cost	2	2	1	5	2	0	1	9	7	8	37	
Fosters an environment in which management encourages associates to train at work	0	4	8	12	1	0	0	6	2	10	43	
Rewards and incentives for successful course completion	2	1	4	7	2	1	1	4	2	5	29	
Reduced course material cost	0	0	1	1	0	0	1	0	13	2	18	
Provides "just-in-time" learning	2	4	6	12	2	8	1	4	2	2	43	
Teaches WD programming standards	5	4	3	12	1	1	1	1	1	3	32	
Number of associate certifications	1	4	2	7	3	0	10	3	2	4	36	
Improves WD's core competencies	5	5	3	13	2	1	2	3	1	5	40	
Level of interactivity and feedback	3	3	7	13	3	1	1	3	2	1	37	
Access to published literature	2	1	4	7	0	3	2	2	3	0	24	
Delivers best practices and new technology	1	7	7	15	0	2	0	2	2	3	39	
Teaches WD-specific methods	5	6	7	18	1	2	0	2	1	4	46	
Provides summary recap, "walkaways", job aids	2	1	5	8	1	3	1	3	5	2	31	
Modularized courses build upon each other	6	7	4	17	1	3	2	3	0	1	44	
e-Learner records easily available for review and self-management	3	2	5	10	0	3	2	2	3	9	39	
Presence of detailed syllabus and prerequisites for all courses	3	4	4	11	0	1	1	4	4	3	35	
Learning tracks are clearly defined	4	2	3	9	0	1	0	6	1	2	28	
Increased associate collaboration	1	3	2	6	5	3	6	5	0	4	35	
Relevance to current or planned projects	2	5	1	8	2	8	0	1	0	3	30	
Learning is fun!	0	2	8	10	1	0	1	1	0	2	25	
New hire (new associate) course availability	1	5	4	10	2	4	2	3	4	4	39	
Improved scorecards in various areas	3	0	1	4	6	2	6	2	2	7	33	
Availability of training 24-7, year-round	3	3	7	13	1	6	2	5	1	1	42	
Course content currency (courses up-to-date)	3	4	3	10	0	4	0	3	4	2	33	
Delivery system performance and reliability	8	5	0	13	3	5	2	3	1	2	42	
Supports and complements mentoring	1	4	2	7	1	1	2	6	2	5	31	
Accredited courses (e.g., college credits, CEUs, degree program, advanced degree program)	3	4	7	14	0	0	0	1	1	3	33	
Improves coursework planning with management	4	4	1	9	1	1	0	2	1	11	34	
Learning is integrated with performance reviews process	1	1	3	5	2	2	1	4	2	9	30	
Availability and quality of electronic reference library	2	3	7	12	2	1	1	2	4	2	36	
Provides opportunities for immediate skill demonstration	5	1	1	7	4	5	4	3	0	2	32	
Increases organizational intelligence (Are we smarter?)	5	3	2	10	5	3	5	4	1	7	45	
Improves organizational performance	4	5	1	10	5	4	5	5	2	7	48	
Enables supervisory observance of learner progress	1	1	1	3	2	1	1	1	1	10	22	
Improves speed of acquiring new knowledge and skill	2	1	3	6	4	3	4	4	0	1	28	
Fosters a learning environment	1	2	7	10	2	0	1	1	2	2	28	
Accommodates remedial training	5	4	6	15	1	2	0	3	0	1	37	
Supports strategic direction of business	1	4	1	6	1	1	2	0	1	8	25	
Improves company reputation for recruiting	0	7	3	10	1	0	0	3	2	5	31	
Breadth of course subjects available (e.g., technology, business, leadership, etc.)	2	1	3	6	1	1	7	3	4	2	30	
Improves ability to meet project milestones	2	2	0	4	3	9	3	6	0	3	32	
Improved learning efficiency	5	1	0	6	6	3	2	4	0	3	30	
Reduces complexity of our systems	4	2	3	9	2	1	0	4	0	2	27	
Improves communications	3	2	1	6	2	4	1	0	0	5	24	
	272	287	314	240	218	243	342	132		318	TOTALS	

Sample Group Rating Input to Gilbert's Criteria									
Statement	OA	OC	OM	OR	OT	OV	CL	CMG	
Presence of measurable learning objectives	10	4	0	2	2	2	2	1	3
Positive trend in test scores	9	4	2	4	1	4	1	0	1
Usability of new knowledge on the job	8	2	1	8	3	4	6	2	4
Improved job performance	8	4	3	8	9	7	8	1	4
Delivery system performance and reliability	8	5	0	3	5	2	3	1	2
Improved computer usage and skills	7	3	1	4	4	4	6	2	1
Improves associate performance	7	4	1	4	2	4	9	0	4
Improved customer service	7	6	4	3	5	2	3	0	3
Percentage of skills transferred to the job	6	3	0	9	5	5	6	0	4
Improved associate reading skills	6	3	0	2	2	4	5	1	1
Improved work group effectiveness	6	3	3	5	5	5	6	0	4
Low course abandonment rate	6	3	4	6	1	5	3	1	3
Course availability for all levels of learners	6	4	3	2	2	3	4	2	3
Modularized courses build upon each other	6	7	4	1	3	2	3	0	1
Improved learning efficiency	5	1	0	6	3	2	4	0	3
Provides opportunities for immediate skill demonstration	5	1	1	4	5	4	3	0	2
Pre-Post course performance improvement	5	2	1	5	2	6	4	2	4
Increases organizational intelligence (Are we smarter?)	5	3	2	5	3	5	4	1	7
Reduces associate percentage with below average performance	5	4	0	6	4	4	6	0	3
Teaches WD programming standards	5	4	3	1	1	1	1	1	3
Accommodates remedial training	5	4	6	1	2	0	3	0	1
Improves WD's core competencies	5	5	3	2	1	2	3	1	5
Teaches WD-specific methods	5	6	7	1	2	0	2	1	4
Ease of course availability	4	2	3	1	6	2	5	2	1
Learning tracks are clearly defined	4	2	3	0	1	0	6	1	2
Reduces complexity of our systems	4	2	3	2	1	0	4	0	2
Ease of course accessibility	4	3	6	2	3	2	6	3	2
Improves coursework planning with management	4	4	1	1	1	0	2	1	11
Reduced learning time	4	4	3	8	9	4	8	0	3
Improves organizational performance	4	5	1	5	4	5	5	2	7
Improved scorecards in various areas	3	0	1	6	2	6	2	2	7
Improves communications	3	2	1	2	4	1	0	0	5
e-Learner records easily available for review and self-management	3	2	5	0	3	2	2	3	9
Increased use of e-Learning	3	2	8	3	1	6	5	3	3
Ease of course navigation	3	3	5	4	5	2	5	1	0
Number of requests for additional courses	3	3	5	4	0	5	4	1	2
Level of interactivity and feedback	3	3	7	3	1	1	3	2	1
Availability of training 24-7, year-round	3	3	7	1	6	2	5	1	1
Course content currency (courses up-to-date)	3	4	3	0	4	0	3	4	2
Presence of detailed syllabus and prerequisites for all courses	3	4	4	0	1	1	4	4	3
Aids or assists growth and career development	3	4	7	4	2	3	5	0	4
Accredited courses (e.g., college credits, CEUs, degree program, advanced degree program)	3	4	7	0	0	0	1	1	3
Accommodation of multiple learning styles	3	5	8	0	2	1	4	1	3
Number of course registrations	2	0	3	4	2	11	2	2	3
Number of hits to online course catalog	2	0	5	5	2	5	2	0	0
Courses are short in duration	2	1	0	5	5	4	6	0	2
Percentage of course evaluations completed	2	1	1	6	0	4	4	0	2
Improves speed of acquiring new knowledge and skill	2	1	3	4	3	4	4	0	1
Breadth of course subjects available (e.g., technology, business, leadership, etc.)	2	1	3	1	1	7	3	4	2
Rewards and incentives for successful course completion	2	1	4	2	1	1	4	2	5
Access to published literature	2	1	4	0	3	2	2	3	0
Provides summary recap, "walkaways", job aids	2	1	5	1	3	1	3	5	2
Rate of voluntary course participation	2	1	6	4	1	3	4	2	1
Improves ability to meet project milestones	2	2	0	3	9	3	6	0	3
Reduced training travel time	2	2	1	3	4	1	10	3	6
Reduced training travel cost	2	2	1	2	0	1	9	7	8
Reduces information overload	2	2	2	0	0	2	3	0	1
Improved ability to unlearn and relearn	2	3	3	2	4	2	4	0	2
Ability to access training outside of work	2	3	7	0	2	1	7	1	1
Availability and quality of electronic reference library	2	3	7	2	1	1	2	4	2
Provides "just-in-time" learning	2	4	6	2	8	1	4	2	2
Courses keep learner's attention	2	4	9	0	1	0	4	0	2
Improves talent recruitment and retention	2	5	1	0	0	1	6	2	6
Relevance to current or planned projects	2	5	1	2	8	0	1	0	3
Level of learner satisfaction	2	8	3	2	1	4	3	1	2
Enables supervisory observance of learner progress	1	1	1	2	1	1	1	1	10
Improves profitability	1	1	2	4	1	4	6	3	6
Increased sales	1	1	2	5	1	8	3	1	4
Learning is integrated with performance reviews process	1	1	3	2	2	1	4	2	9
Fosters a learning environment	1	2	7	2	0	1	1	2	2
Increased associate collaboration	1	3	2	5	3	6	5	0	4
Increased rate of internal promotion	1	3	3	5	2	2	2	0	7
Level of associate participation after-hours	1	3	7	3	3	3	6	0	1
Learner suggestions are actively solicited and acted upon for course improvement	1	3	8	0	1	1	2	3	5
Supports strategic direction of business	1	4	1	1	1	2	0	1	8
Number of associate certifications	1	4	2	3	0	10	3	2	4
Supports and complements mentoring	1	4	2	1	1	2	6	2	5
New hire (new associate) course availability	1	5	4	2	4	2	3	4	4
Improved associate satisfaction and morale	1	6	1	3	2	2	5	0	2
Delivers best practices and new technology	1	7	7	0	2	0	2	2	3
Promotes continuous learning	1	8	5	0	0	2	3	0	2
Reduced course material cost	0	0	1	0	0	1	0	13	2
Number of courses completed (required and optional)	0	1	1	5	2	10	4	4	1
Degree of management support	0	2	1	1	2	2	1	1	13
Learning is fun!	0	2	8	1	0	1	1	0	2
e-Learning is perceived as an associate benefit	0	3	8	1	1	1	3	0	3
Positive informal feedback (word-of-mouth)	0	4	5	2	0	0	1	0	1
Fosters an environment in which management encourages associates to train at work	0	4	8	1	0	0	6	2	10
Promotes associate empowerment	0	5	5	1	0	1	3	0	4
Improves company pride and brand name	0	6	5	1	0	1	1	0	4
Improves company reputation for recruiting	0	7	3	1	0	0	3	2	5

### e-Learning Frequencies Across 9 Categories



**e-Learning Criteria Selections  
(91 Statements by Category)**



Brian Petersen is the co-founder in 2004 of e-Learning For Kids Foundation, a non-profit organization that develops on-line courseware for children between the ages of 5 to 12 years of age. All courseware is FREE and is available at [www.e-learningforkids.org](http://www.e-learningforkids.org)

**Opening Doors to Education Worldwide**

*e-Learning  
for* **ids**  
A global non-profit foundation



## SUMMARY PROTOCOL FORM UNIVERSITY HUMAN RESEARCH ETHICS COMMITTEE

### IMPORTANT:

Approval of a *Summary Protocol Form* (SPF) must be issued by the applicable Human Research Ethics Committee prior to beginning any research project using human participants.

Research funds cannot be released until appropriate certification has been obtained.

### FOR FACULTY AND STAFF RESEARCH:

Please submit a signed original plus THREE copies of this form to the UHREC c/o the Office of Research, GM-1000. Allow one month for the UHREC to complete the review.

### FOR GRADUATE or UNDERGRADUATE STUDENT RESEARCH:

- if your project is included in your supervising faculty member's SPF, no new SPF is required
- if your project is supported by external (e.g. CIHR, FQRSC) or internal (e.g. CASA, FRDP) funds, the supervising faculty member must submit a new SPF on behalf of the student as per faculty research above. The supervising faculty member MUST be listed as the PI.
- if your project is NOT supported by external (e.g. CIHR, FQRSC) or internal (e.g. CASA, FRDP) funds, the student must submit a new SPF to the relevant departmental committee. Contact your department for specific details.

### INSTRUCTIONS:

This document is a form-fillable word document. Please open in Microsoft Word, and tab through the sections, clicking on checkboxes and typing your responses. The form will expand to fit your text. Handwritten forms will not be accepted. If you have technical difficulties with this document, you may type your responses and submit them on another sheet. Incomplete or omitted responses may cause delays in the processing of your protocol.

### 1. SUBMISSION INFORMATION

Please provide the requested contact information in the table below:

Please check ONE of the boxes below :

- This application is for a new protocol..
- This application is a modification or an update of an existing protocol:  
Previous protocol number (s): \_\_\_\_\_

### 2. CONTACT INFORMATION

Please provide the requested contact information in the table below:



Principal Investigator/ Instructor (must be Concordia faculty or staff member)	Department	Internal Address	Phone Number	E-mail
Brian Petersen	Educational Technology		949-348-3878	
Co-Investigators / Collaborators		University / Department		E-mail
Dr. Gary Boyd		Concordia / Education		gboyd@concordia.ca
Research Assistants		Department / Program		E-mail

### 3. PROJECT AND FUNDING SOURCES

Project Title:	Measuring e-Learning Program Effectiveness: A Stakeholder Approach to Scorecarding Performance. (A PhD dissertation)
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In the table below, please list all existing internal and external sources of research funding, and associated information, which will be used to support this project. Please include anticipated start and finish dates for the project(s). Note that for awarded grants, the grant number is REQUIRED. If a grant is an application only, list APPLIED instead.

Funding Source	Project Title	Grant Number	Award Period	
			Start	End
	Not Applicable			

### 4. BRIEF DESCRIPTION OF RESEARCH OR ACTIVITY

Please provide a brief overall description of the project or research activity. Include a description of the benefits which are likely to be derived from the project. Alternatively, you may attach an existing project description (e.g. from a grant proposal).

This study will explore stakeholder variation in perceptions about performance criteria requirements for evaluating e-learning program effectiveness. The central focus for the research involves the following three questions: (1) What key performance criteria (KPC's) could contribute to developing a model to measure the effectiveness of a e-learning programs within an organization, (2) to what extent do stakeholder groups differ in their perceptions about the key performance criteria and importance in evaluating e-learning programs, and (3) what key performance indices (KPI's) could be used in the development of an e-Learning Effectiveness Index (e-LEI) scorecard. The hypothesized answer to question 1 is that all performance requirements based on Gilbert's evaluation model (1996) for effective

performance measurement can be found relevant and can be classified by each stakeholder group in forming criteria for measuring effective e-learning. The hypothesized answer to question 2 is that each stakeholder group will have significantly different perceptions of the type and importance of what performance criteria should be used in evaluating effective e-learning programs. The hypothesized answer to question 3 is that key performance criteria integrated into Gilbert's model of performance requirements can be used in the development of a balanced scorecard that provides management insight on how effective their e-learning programs are operating. Concept mapping is an evaluation approach developed by Trochim (1993) from Cornell University and pattern matching techniques will be used in a single case study involving 45 performance designers, end-users and managers from a large food retailing company to investigate stakeholder variation. The investigation's findings will be reported and implications will be developed for e-learning program evaluation and future research.

#### Research Methods:

- The use of and discussion of concept mapping in evaluation practice has been steadily growing over the past 15 years (Rizzo-Michelin, 1997). Although several approaches to concept mapping have been developed, the approach by Trochim (1993) was selected for use in the present study based on its well documented use in evaluation and program planning as well as its suitability for comparing group views using pattern matching techniques. Several authors have also described the use of this technique in both training evaluation and organizational studies (Cousins & MacDonald, 1998; Kolb & Shepard, 1997).
- This research will involve the use of the Concept Mapping System (Concept Systems, 2001). The preliminary concept mapping activity will require members of multi-stakeholder groups to generate statements in response to a focused instructional question regarding performance criteria used for the evaluation of e-learning programs.
- Three distinct stakeholders will be defined to be included in this research: (1) performance designers (those who design and develop e-learning instruction and programs), (2) End-Users (those employees in the organization who use e-learning programs, and (3) Managers (Those who pay for the end-user to have e-learning programs available for learning purposes).
- Typically recommended sample group size for concept mapping is 15 (Trochim, 1993). Therefore, a total of 45 stakeholders will be invited for participation in this research project. Final interviews by the researcher with 4 other organizations external to the case organization will be held. Exploration and investigation by the researcher during the interview sessions will determine the applicability and usefulness of the e-Learning Effectiveness Index (e-LEI) scorecard procedure and tool.

#### Procedures:

- The raw response statements will be collected, and then will be sorted by all individual stakeholders participating in the research project. All statements will be rated on a five-point scale for general importance as specific performance criteria for e-program evaluation. All sorting and rating will be done as an individual activity via e-mail on the Internet.
- Three concept maps will be created based on the results of the research and pattern matching will be performed between stakeholders.
- The primary statistical procedures of multidimensional scaling and cluster analysis in concept mapping will be used in this research. Pattern matching analysis will also be used in this research. This will identify measures, similarities and differences between stakeholder groups.
- Outcomes of the concept mapping activity that identifies key performance criteria will be used to develop an on-line survey that stakeholders will use to measure their perceptions of

the e-learning program effectiveness. The results will provide input into the development of an e-Learning Effectiveness Index scorecard. Finally, four interviews will be performed with e-learning supervisors in four separate Fortune 500 companies. The interview will gather input from these supervisors in determining the applicability and usefulness of determining evaluation performance criteria for their e-learning systems and the usefulness of gathering specific evaluation metrics in the creation of an e-Learning Effectiveness Index (e-LEI) scorecard.

#### Educational Purpose/Benefits:

Exploration of these questions has important implications for the measurement and evaluation of e-learning program effectiveness. With clearly defined performance criteria available for evaluating e-learning programs, organizations can clarify their corporate learning vision through measurable goals and outcomes. (Shepko & Douglas, 1998). This vision drives the learning that takes place within the organization, aligns the stakeholders to the organization's overarching business strategy and reveals their successes. To achieve this goal, organizations need to measure what they are doing and how well they are achieving their goals against an initial set of performance criteria or benchmarks. (Kaplan, 1992). Kaplan (1992) goes on further to point out that one of the key components to any evaluation initiative is to have a set of performance criteria—a milestone from which to start. If the organization does not have pre-defined performance criteria to measure from, then the starting point can be difficult to determine. Once performance models have been built to use as the benchmark criteria, it is a matter of continuous evaluation against those criteria (scorecard), followed by targeted plans to improve post evaluation performance. The basis of a strategic e-learning program score card development is a methodology that will enable training managers to establish their strategic e-learning program objectives across a holistic view of organizational training and development needs and the business objectives, and to identify relevant measures that will allow them to control and monitor e-learning program performance against these objectives.

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#### 5. SCHOLARLY REVIEW / MERIT

Has this research been funded by a peer-reviewed granting agency (e.g. CIHR, FQRSC, Hexagram)?

Yes      Agency: \_\_\_\_\_

No      If your research is beyond minimal risk, please complete and attach the Scholarly Review Form, available here:  
<http://oor.concordia.ca/REC/forms.shtml>

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#### 6. RESEARCH PARTICIPANTS

a) Please describe the group of people who will participate in this project.

The research participants will be made up of adults who voluntarily offered to participate in the study. There are three sample groups from the Information Technology department within a Fortune 200 company located in Jacksonville, Florida. The three organizational groups consist of 13 managers, 13 performance designers and 14 e-learning end-users. An e-mail will be sent to each of the three stakeholder groups (total sample size = 550) outlining the research study and requesting participants from all groups. Any interested participant

will respond by email to the researcher who will keep these participant's private information on his laptop.

- b) Please describe in detail how participants will be recruited to participate. Please attach to this protocol draft versions of any recruitment advertising, letters, etcetera which will be used.

The participants who responded to the first e-mail will be sent notices describing the study and outlining the nature of participation involved (See attached). Only participants who volunteer will be used and no incentives will be offered. All information captured during the research project will be kept on a laptop which the researcher will only have access to. No information and data will be available to anyone through the corporate server.

This study will in no way endanger the physical or psychological well being of the participants. The nature of the study to be carried out deals with the identification and validation of performance criteria that can be used to evaluate e-learning program effectiveness through the deployment of a balanced scorecard.

- c) Please describe in detail how participants will be treated throughout the course of the research project. Include a summary of research procedures, and information regarding the training of researchers and assistants. Include sample interview questions, draft questionnaires, etcetera, as appropriate.

Sample group participants will be informed of what is expected of them in terms of time and effort involved in this research project. Participants will be informed that any data results published will not disclose the identities of participants involved unless their expressed consent is given.

The research study will be carried out over a one month period. Study participants will be asked to attend two one hour concept mapping sessions where they will be part of a stakeholder group ( either managers, end-users and Performance designers) with each group being no more than 15 participants, and they will collectively brainstorm to identify potential key performance criteria. The focus statement they are being asked to brainstorm on is, "Generate statements (short phrases of sentences) that describe specific performance criteria that can be used to evaluate the effectiveness of the e-learning program at your company?" A focus prompt will be used by respondents as a check while generating statements to stay on task. The focus prompt is "A specific performance criteria that can be used to evaluate the effectiveness of your company's e-learning program is...". Then, they will individually rank the performance criteria in terms of their perceived importance with regard to evaluating e-learning program effectiveness. This activity will take place in a closed door conference room. Two one hour homework sessions will be performed individually at their desk's on their computer and the results will be emailed to the researcher. A second closed door session of approximately one-hour will involve all three sample groups together, where they will review the concept mapping results from the first session that were entered into the Concept Mapping Software application on the researcher's laptop computer, and determine names and groupings of the concept maps. All information collected during this phase will be kept confidential with no written reports being given to any participant.

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## 7. INFORMED CONSENT

- a) Please describe how you will obtain informed consent from your participants. A copy of your written consent form or your oral consent script must be attached to this protocol. *Please note: written consent forms must follow the format of the template included at the end of this document.*

Participants will be given the opportunity to give free and informed consent about participation, as well as consent regarding the confidentiality of that participation. Evidence of free and informed consent by subjects will be obtained in writing.

- b) In some cultural traditions, individualized consent as implied above may not be appropriate, or additional consent (e.g. group consent; consent from community leaders) may be required. If this is the case with your sample population, please describe the appropriate format of consent and how you will obtain it.

This is not applicable to this research study.

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## 8. DECEPTION AND FREEDOM TO DISCONTINUE

- a) Please describe the nature of any deception, and provide a rationale regarding why it must be used in your protocol. Is deception absolutely necessary for your research design? Please note that deception includes, but is not limited to, the following: deliberate presentation of false information; suppression of material information; selection of information designed to mislead; selective disclosure of information.

No deception is required or will be used for this study. Participants will be made aware of what is expected of them before beginning. Participants will have access to research findings.

- b) How will participants be informed that they are free to discontinue at any time? Will the nature of the project place any limitations on this freedom (e.g. documentary film)?

Participants will be informed of their right to discontinue at any time and informed as well that their identities will remain confidential unless they give written consent, which dictates otherwise. The researcher will terminate participation if any risk of a physical and/or psychological nature is discerned.

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## 9. RISKS AND BENEFITS

- a) Please identify any foreseeable risks or potential harms to participants. This includes low-level risk or any form of discomfort resulting from the research procedure. When appropriate, indicate arrangements that have been made to ascertain that subjects are in "healthy" enough condition to undergo the intended research procedures. Include any "withdrawal" criteria.

1. During the focus group sessions held three times, participants are asked to brainstorm on performance criteria that they perceive would be useful as a measurement metric in evaluating their e-learning program's effectiveness. It is possible that when a participant suggests a performance criteria that others might not feel it is appropriate and could make the participant who suggested the criteria be uncomfortable. Method of Prevention: Before, the focus groups begin the brainstorming a PowerPoint presentation by the researcher will be made. This presentation outlines the concept mapping procedure and how the focus groups will contribute to developing performance criteria. The researcher will instruct the participants to be "open" and that there is "no right or wrong answers" so they should be "creative" in their thinking of such criteria. The researcher will also manage the focus groups to ensure to participant becomes inappropriate to any other participant. If this does occur, a "violation" will be asked to stop immediately or to leave the group.

- b) Please indicate how the risks identified above will be minimized. Also, if a potential risk or harm should be realized, what action will be taken? Please attach any available list of referral resources, if applicable.

Extensive procedures have been taken to prevent putting someone at risk as part of the research efforts. All aspects of participation will be known by potential participants prior to their involvement in the study.

- c) Is there a likelihood of a particular sort of "heinous discovery" with your project (e.g. disclosure of child abuse; discovery of an unknown illness or condition; etcetera)? If so, how will such a discovery be handled?

There is no risk of a heinous discovery in this research project.

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## 10. DATA ACCESS AND STORAGE

- a) Please describe what access research participants will have to study results, and any debriefing information that will be provided to participants post-participation.

The research will be explained to participants at the beginning of the study. Participants will be informed where to reach the researcher in order to find out about the general research results. The identity of individuals will be protected by only letting the researcher involved have access to the complete data set that will be kept on the researcher's personal laptop.

- b) Please describe the path of your data from collection to storage to its eventual archiving or disposal. Include specific details on short and long-term storage (format and location), who will have access, and final destination (including archiving, or any other disposal or destruction methods).

Data will be collected during the following three phases. (1) Concept Mapping and homework (2) Ranking of Performance Criteria in Gilbert's categories, and (3) on-line survey

completion by sample group and 4 interviews of e-learning supervisors. All data will be collected during focus group sessions and interviews. The data will be stored on the researcher's laptop and back-up each day onto a CD rom. The cd rom will be stored in a secure enviroment at the researchers home located at 6303 Tealwood Place, Ottawa, Ontario Canada. After completion and defense of the research study the information will be remove from the researchers laptop. Only one final CD Rom will be kept in the secure location in the researcher's home.

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## 11. CONFIDENTIALITY OF RESULTS

Please identify what access you, as a researcher, will have to your participant(s) identity(ies):

<input type="checkbox"/>	Fully Anonymous	Researcher will not be able to identify who participated at all. Demographic information collected will be insufficient to identify individuals.
<input type="checkbox"/>	Anonymous results, but identify who participated	The participation of individuals will be tracked (e.g. to provide course credit, chance for prize, etc) but it would be impossible for collected data to be linked to individuals.
<input type="checkbox"/>	Pseudonym	Data collected will be linked to an individual who will only be identified by a fictitious name / code. The researcher will not know the "real" identity of the participant.
<input checked="" type="checkbox"/>	Confidential	Researcher will know "real" identity of participant, but this identity will not be disclosed.
<input type="checkbox"/>	Disclosed	Researcher will know and will reveal "real" identity of participants in results / published material.
<input type="checkbox"/>	Participant Choice	Participant will have the option of choosing which level of disclosure they wish for their "real" identity.
<input type="checkbox"/>	Other (please describe)	

- a) If your sample group is a particularly vulnerable population, in which the revelation of their identity could be particularly sensitive, please describe any special measures that you will take to respect the wishes of your participants regarding the disclosure of their identity.

The sample groups identity is not sensitive to any outside sources in this study.

- b) In some research traditions (e.g. action research, research of a socio-political nature) there can be concerns about giving participant groups a "voice". This is especially the case with groups that have been oppressed or whose views have been suppressed in their cultural location. If these concerns are relevant for your participant group, please describe how you will address them in your project.

Not relevant to this study

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## 12. ADDITIONAL COMMENTS

- a) Bearing in mind the ethical guidelines of your academic and/or professional association, please comment on any other ethical concerns which may arise in the conduct of this protocol (e.g. responsibility to subjects beyond the purposes of this study).

I do not believe that there are any ethical concerns in and beyond this research study occurring.

- b) If you have feedback about this form, please provide it here.

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### 13. SIGNATURE AND DECLARATION

Following approval from the UHREC, a protocol number will be assigned. This number must be used when giving any follow-up information or when requesting modifications to this protocol.

The UHREC will request annual status reports for all protocols, one year after the last approval date. Modification requests can be submitted as required, by submitting to the UHREC a memo describing any changes, and an updated copy of this document.

**I hereby declare that this Summary Protocol Form accurately describes the research project or scholarly activity that I plan to conduct. Should I wish to add elements to my research program or make changes, I will edit this document accordingly and submit it to the University Human Research Ethics Committee for Approval.**

**ALL activity conducted in relation to this project will be in compliance with :**

- ***The Tri Council Policy Statement: Ethical Conduct for Research Involving Human Subjects*, available here:**

**<http://www.pre.ethics.gc.ca/english/policystatement/policystatement.cfm>**

- **The Concordia University Code of Ethics: Guidelines for Ethical Actions**

**Signature of Principal Investigator:** \_\_\_\_\_

**Date:** January 17, 2007