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The Development and Application of a Checklist for Evaluating E-Learning in Organizations

Anne-Marie Guidy-Oulai

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THE DEVELOPMENT AND APPLICATION OF A CHECKLIST FOR EVALUATING E-LEARNING IN ORGANIZATIONS

by

Anne-Marie Guidy-Oulai

A Dissertation Submitted to the Faculty of The Graduate College in partial fulfillment of the requirements for the Degree of Doctor of Philosophy Department of Educational Leadership, Research and Technology Advisor: Dr. Gary Miron

Western Michigan University Kalamazoo, Michigan June 2009
THE DEVELOPMENT AND APPLICATION OF A CHECKLIST FOR EVALUATING E-LEARNING IN ORGANIZATIONS

Anne-Marie Guidy-Oulai, Ph.D.
Western Michigan University, 2009

In the last two decades, organizations have increasingly used computer-based instruction as a method to deliver training to employees and instruction to students. The e-learning market reached $50 billion in 2005 and is expected to double by 2010. A number of different evaluation models can and have been used to measure effectiveness and worth of programs. However, the literature indicates the evaluation of e-learning may need to develop new models for evaluation.

The purpose of this study is to develop a framework to enhance the process of e-learning evaluation in organizations. The E-Learning Evaluation Checklist (ELEC)—which was developed and applied in this dissertation—is based on Scriven’s Key Evaluation Checklist and addresses elements required for evaluation of e-learning in organizations.

Three sequential and distinct data collection phases were used in this study: (a) an expert panel review, (b) a pilot study using the draft checklist, and (c) an online survey of persons that might be interested to used this checklist. Revisions were made to the checklist after each phase of data collection. Feedback from the expert panel members helped to focus and streamline the checklist. Their suggestions also ensured
that the checklist was more understandable for a broader audience. The pilot study involved using the checklist to guide the development of an evaluation plan for a local e-learning program. This activity helped the author understand and address some of the questions and weaknesses that others would face when using the checklist. The data from the online survey of e-learning by professionals yielded information on how the checklist was perceived by a broader audience.
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This dissertation has been a long journey filled with twists and turns, trials and tribulations in my personal and professional life. This is the fulfillment of a long-pursued dream and it is by far the greatest academic accomplishment I have ever undertaken.

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To my husband Andre, thank you very much for your support and your willingness to help me and see me achieve this goal.

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CHAPTER I

INTRODUCTION

Statement of the Problem

Learning is an important function for organizations and allows employees to acquire new skills required for the organization to gain a competitive advantage and increase efficiency and effectiveness (O’Driscoll, Sugrue, et al., 2005). An emerging method used to disseminate learning through the organization is known as electronic learning (Driscoll, 2002; Galvin, 2002; Smart & Cappel, 2006; Yaw, 2005). Electronic learning (e-learning) is defined as the delivery of learning materials through computer-based or telecommunication media such as the Internet, intranets, and extranets, as well as digital medium (i.e., CD-ROM, satellite TV, and audio- or videotape) (Kathawala & Wilgen, 2004; LearnFrame, 2001; Pfeifer, 2004; PrimeLearning, 2001; Smart & Cappel, 2006).

E-learning can either be asynchronous or synchronous. An asynchronous e-learning interaction is delayed and trainers can take the learning based on their availability. Learners can take the training from any location. Synchronous learning takes place in real-time and interaction happens simultaneously. In this instance, learners have to attend class at a scheduled time, although with e-learning they can do this from almost anywhere.
E-learning has been on the rise in the last two decades due to the integration of technology into education and training (Smart & Cappel, 2006). Recent advances and innovations in information technology (IT) have shifted learning methods from the face-to-face traditional classroom environment to an on-demand environment, allowing learning to take place from a distance and at any time (Chandras, Delambo, & Eddy, 2005; O'Malley & McCraw, 2000). As Driscoll (2002) noted, e-learning has the ability to quickly reach a large geographically dispersed audience. As such, organizations are beginning to view e-learning as a cost-effective mode of training (Driscoll, 2002; Gold, 2003; Henderson, 2003; Smart & Cappel, 2006; Yaw, 2005). According to Riviera and Paradise (2006), numerous organizations using e-learning have reported decreases in costs and higher efficiency in learning. It is also estimated American corporate expenditures on e-learning grew from $3 billion in 1999 to $11 billion in 2003 (Koprowski, 2000; Smart & Cappel, 2006). In 2004, e-learning represented half of the market of United States business-skill training and was worth $16.9 billion. The e-learning market reached $50 billion in 2005 and is expected to grow to $100 billion by 2010. With all the expenditures on e-learning programs, it is necessary for evaluations to be conducted to determine effectiveness in the organization.

As defined by Patton (1990), evaluation is the systematic collection of information about the activities, characteristics, and outcomes of a program, personnel, and products for use by specific groups of people to reduce uncertainties, improve effectiveness, and determine if goals are met. Stufflebeam (2001) also defined evaluation as a research study designed and conducted to assist an audience in assessing an object's merit or worth. Another definition proposed by Worthen, Sanders, and Fitzpatrick (1997)
described evaluation as “the identification, clarification, and application of defensible criteria to determine an evaluation object’s value (worth or merit), quality, utility, effectiveness, or significance in relation to those criteria” (p. 5). Perhaps the simplest definition of evaluation is the one proposed by Scriven (1991), defining evaluation as the systematic determination of the merit, worth, or significance of something (the evaluand). The evaluand is the object of evaluation and can be a program, a process, or a product. Evaluation can be applied to a multitude of disciplines: education, social science, business, health, or organization (O’Connor, 2006). Evaluation can be conducted at the beginning of a program as a formative evaluation or at the end of a program as a summative evaluation (Worthen et al., 1997).

Evaluation is important for any organization because it supports the determination of the effectiveness of any program at any point, from needs assessment, to ongoing adjustments and program quality improvement (Brown & Seidner, 1998). Furthermore, an evaluation provides information to both develop and defend a program’s worth and merit by continuously supplying managers with the information they need to plan, direct, control, and report on their programs or spheres of responsibility (Stufflebeam, Madaus, & Kellaghan, 2000).

E-learning evaluation is conducted through different methods. Some organizations use the Kirkpatrick model to evaluate e-learning (Kathawala & Wilgen, 2004; Kirkpatrick, 1975; Kruse, 2007; O’Connor, 2006; Yaw, 2005). From 1959 to 1960, Kirkpatrick introduced a framework for evaluating the effectiveness of training programs. The framework describes four steps, known as levels, used by training directors to
evaluate programs (Kirkpatrick, 1994). The four levels, as shown in Table 1, are (a) reaction, (b) learning, (c) behavior, and (d) result.

Table 1

*Kirkpatrick Four-Level Framework*

<table>
<thead>
<tr>
<th>Level of Evaluation</th>
<th>Brief Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reaction</td>
<td>Measure how participants feel about the training</td>
</tr>
<tr>
<td>Learning</td>
<td>Measures the amount of learning that takes place in the program</td>
</tr>
<tr>
<td>Behavior</td>
<td>Measures changes in behavior on the job</td>
</tr>
<tr>
<td>Result</td>
<td>Measures the achievement of results desired such as decreased costs, increase in quality and productivity</td>
</tr>
</tbody>
</table>

Source: *Usage and Value of Kirkpatrick's 4 Levels of Training Evaluation* (Pulichino, 2007, p. 6)

Another evaluation model used for e-learning evaluation in organizations is Phillips' (1996) model (Kathawala & Wilgen, 2004). This model is an improvement of the Kirkpatrick's original model and adds return on investment (ROI) as a fifth level (Kathawala & Wilgen, 2004; Phillips, 1996). Other methods of evaluation have been used as well in organizations to evaluate e-learning.

**Background**

The context and foundation of this research is three-fold: learning in organizations, e-learning in the organizations, and evaluation in organizations. This section will briefly introduce and outline the three concepts as they relate to the study.
Learning in Organizations

According to *Oxford Advanced Learner's Dictionary* (1974), learning is defined as gaining knowledge of or skill in a subject area through study, practice, or teaching. Learning at an individual level deals more with knowledge gained, skills, and understanding. In contrast, learning should be aligned with visions, goals, strategies, and transfer of knowledge at the organizational level.

Learning in organizations is also viewed as the constant testing of experience and how experience is transformed into knowledge available to the whole organization and also applicable to its core principles (Senge et al., 1999). Learning organizations are characterized by multiple views. Some approach it as a top-down (e.g. senior management) initiative involving a managerially imposed vision (Hughes & Tight, 1998; Pedler, Burgoyne, & Boydell, 1991). Others view it as a bottom-up approach, in which case there is a collaborative process where employees are involved in the process (Watkins & Marsick, 1992). Learning organizations function on the premise that value and effectiveness of learning is based on how new information is disseminated (Kerka, 1995). Regardless of the approach used, organizational learning is a means of achieving strategic goals (Finger & Brand, 1999; Leadbeater, 2000; Senge, 1994).

E-Learning in Organizations

E-learning is a method using technological tools to deliver knowledge (Kathawala & Wilgens, 2004). Tools such as Web-based learning, virtual classroom, and digital collaboration enable distance education through Internet, intranets, and extranets.
E-learning has become a predominant method for training in organizations (Harris, 2003; Kathawala & Wilgen, 2004; Pfeifer, 2004; Rooney, 2003; Smart & Cappel, 2006; Yaw, 2005). The capacity of organizations to quickly adapt to innovation is a determining factor of success (Roche, Ireland, & Mummert, 2006).

E-learning in organizations is viewed mainly as a training tool. One of the main reasons cited by an organization for delivering training, as well as information, through e-learning is cost effectiveness (Baxter, 2006; Kathawala & Wilgen, 2004; Riviera & Paradise, 2006; Ward & Riley, 2008). This is explained by the fact that e-learning can reduce or even eliminate traveling cost or time as well as pay for trainers (Kathawala & Wilgen, 2004). Other reasons cited for the choice of e-learning by organizations are convenience, flexibility, and speed (Rooney, 2003).

**Evaluation in Organizations**

Evaluation is common practice and is a critical success factor for organizations (O’Connor, 2006). Evaluation is important to an organization because it helps identify if goals and objectives are achieved and their impact on the organization. Evaluation also helps in determining if the organization is adapting to innovation such as new technology and areas in need of improvement. Evaluation models such as the Decision/Accountability-Oriented Evaluation approach (Stufflebeam et al., 2000) provide important information to managers for their decision-making process. Other methods for organizational evaluation include the Balance Score Card (BSC) (Kaplan & Norton,
Purpose of the Study

Even though there is an array of methods/models used for e-learning evaluation in organizations, there is a growing concern among researchers as to whether e-learning is being adequately evaluated in organizations. In fact, the literature appears to be in broad agreement regarding difficulties in conducting satisfactory evaluations of e-learning in organizations. As O’Connor (2006) stated, evaluators need to rethink processes and methods of evaluation specifically for e-learning evaluation. According to Sloman (2002), research examining the effectiveness of e-learning has lagged behind, even though the use of computer and communication technologies for learning in organizations has expanded rapidly. Driscoll (2002) also noted the need for more research to determine the effectiveness of e-learning. Those problems are attributed, in part, to the fact that organizations equate the effectiveness of e-learning with the financial goals of the organization. Consequently, some organizations evaluate e-learning on the basis of return on investment (ROI), or cost-benefit analysis (CBA) only. Evaluation of e-learning should go beyond financial goals and include all factors related to the use and implementation of e-learning in organizations.

Methods such as evaluation checklists can be utilized to address all aspect of e-learning. Checklists are mnemonic devices gathering lists of what is needed to complete a particular duty (Scriven, 2007b). As stated by Scriven (2007b), checklists include “factors, properties, aspects, components, criteria, tasks or dimensions” (p. 1). Checklists
are easy to understand, therefore allow stakeholders to comprehend the process of the evaluation; they also help the evaluator to keep track of all the criteria necessary to conduct a specific evaluation (Scriven, 2007b; Stufflebeam, 2000).

The purpose of this study is to conduct a comprehensive review of existing methods/models used by organizations to evaluate e-learning and to develop a framework to enhance the process of e-learning evaluation in organizations. The checklist will guide professional evaluators, e-learning professionals, and organizational trainers in their evaluation process. The comprehensive checklist will be based upon the Key Evaluation Checklist (KEC) (Scriven, 2007a). Scriven (2007a) provides several factors to look at and investigate during evaluations of programs, projects, and organizations.

The focus of this study is limited to synchronous and asynchronous computer-based training, also known as CBT (see Figure 1 for e-learning types and focus of the study). CBT uses applications installed or downloaded on a computer, and trainees can use those applications according to their desired pace. The asynchronous method does not require learners and teachers to be in communication at the same time (Ruhe & Zumbo, 2009). Synchronous methods require that learners and teachers interact simultaneously. In either modality, trainees can access the program through the network usually through the intranet or Internet. Computer-based training is mainly used by organizations because of the flexibility and convenience it offers to trainees. During the CBT, trainees can get immediate feedbacks on their performance, and they can work at their own pace. Usually a training module can be revisited multiple times.

Because of their mnemonic function, checklists will be appropriate for organizations characterized as learning organizations regardless of size and ownership.
This study will make a contribution to the field of evaluation by developing a new instrument for evaluating e-learning effectiveness in the organization. As such, it will add to the existing body of knowledge geared toward e-learning evaluation.

*Figure 1.* E-learning modalities.

**Definitions**

*A Anatomy of Performance:* Analytical approach developed by Geary Rummler in 2001. This model is founded on the notion that organizations function as systems. The model identifies factors affecting individual performance as well as organizational results (Rummler, 2002, p. 14).
**Ascriptive Evaluation**: An evaluation conducted to acquire knowledge and gather documentation about an evaluand. This type of evaluation does not support the decision-making process.

**ASTD**: American Society for Training and Development is the leading HRD association with 70,000 members representing 150 countries. This association publishes three publications: *Training & Development, Performance in Practice*, and *HRD Quarterly*.

**Balanced Score Card**: A method used in a company to convert its vision and strategy into action (Baltzan, Phillips, & Haag, 2008, p. 42).

**Competitive Advantage**: When an organization is the first to produce a product or service their customers value that competitors do not have (Baltzan et al., 2008, p. 17).

**Cost Benefit Analysis**: Method determining if the benefit outweighs the cost in an investment. The present value of the benefits deriving from an investment are compared to the present value of the costs associated with that investment (Schniederjans, Hamaker, & Schniederjans, 2004, p. 140).

**Critical Success Factor**: A factor that is crucial to the success of an organization (Baltzan et al., 2008, p. 562).

**Distance learning**: Instructional design aimed at delivering teaching to students who are not physically on site.

**Evaluand**: The object of the evaluation. It can be a program, product, or process.

**Evaluation Models**: Methodologies used to determine the merit and worth of an evaluand. Examples of evaluation models used in this study are Kirkpatrick’s four levels model and Phillips’ training evaluation model.
**Evaluation:** "The identification, clarification, and application of defensible criteria to determine an evaluation object’s value (worth or merit), quality, utility, effectiveness, or significance in relation to those criteria" (Worthen et al., 1997, p. 5).

**Extranets:** An expansion of the intranets allowing access only to business partners, suppliers, and customers (Baltzan et al., 2008, p. 564).

**Formative Evaluation:** An evaluation conducted to provide valuable evaluative information to improve a program. Formative evaluation is usually conducted during program development (Worthen et al., 1997, p. 518).

**HRD:** Human Resources Development includes adult and continuing education development, and training in educational institutions, business and industry, government agencies, voluntary organizations, religious institutions, labor unions, and mass media, and training by commercial providers (Knowles, 1990; Nadler & Nadler, 1994).

**Information Technology:** "All forms of technology used to create, store, exchange, and use data, information, and knowledge; also, the infrastructure of the networked economy" (McKeown, 2001, p. 19).

**Internet:** A public network of computers worldwide (Baltzan et al., 2008, p. 566).

**Intranets:** Private networks based on the Internet technology that allow access only to employees (Baltzan et al., 2008, p. 17).

**Key Evaluation Checklist (KEC):** A checklist developed by Dr. Michael Scriven (2007a), which "reminds evaluators of the factors that they should investigate, assess, and report on in an evaluation" (Wingate, 2002, p. 3).

**Learning:** A process of gaining knowledge of or skill in a subject area through study, practice, or teaching (*Oxford Advanced Learner’s Dictionary*, 1974).
Online Learning (e-learning): Electronic mean of delivering instruction, which involves the use of Internet, intranets, or multimedia (e.g., CD-ROM, DVD) (Smart & Cappel, 2006, p. 202).

Return on Investment (ROI): A financial analysis method used to draw a comparison between the rate of return on investment and the opportunity cost. This method determines if resources are being used profitably (Schniederjans et al., 2004, p. 125).

Six Sigma: A business management strategy designed by Motorola in the early 1980s. This method aims at identifying and removing errors or defects in business and the manufacturing process (Pyzdek, 2003).

Summative Evaluation: An evaluation conducted to provide judgment about the merit and worth of a program. This type of evaluation is conducted at the end of the program and is used to determine continuation, expansion, or termination of a program (Worthen et al., 1997, p. 522).

Total Quality Management: An approach used by management to improve efficiency and effectiveness in the organization (Worthen et al., 1997, p. 522).

Summary

Chapter I provided an introduction to e-learning evaluation in the organization and the challenges that organizations face in evaluating e-learning effectiveness. Chapter II provides a review of the concerns linked to e-learning evaluation and the approaches currently used to conduct e-learning evaluation in organizations. Chapter III presents the process for developing the new framework for e-learning evaluation, referred to as
E-Learning Evaluation Checklist (ELEC). Chapter IV discusses the methodologies used to validate the ELEC framework and presents the limitations of the study. Chapter V presents the findings, and Chapter VI discusses the implications and offers suggestions for further research.
CHAPTER II

REVIEW OF THE LITERATURE

This study addressed a number of distinct and interrelated areas. First, the literature review presents a discussion on organizational learning followed by e-learning, evaluation in organizations, and e-learning evaluation methods. The literature presented underlines a trend for the implementation of e-learning in organizations as well as the challenges presented by evaluation methods and opportunities for e-learning organizations.

Organizational Learning

Learning is defined as the process of gaining knowledge, understanding, and enhancing skills. Kolb (1984) defined learning as an interactive process and presented a four-stage model to explain how individuals learn through a cycle. Figure 2 illustrates the learning cycle model. The four stages are reflection, experience, planning, and conceptualization. Reflection involves a thinking process where learners try to understand and “know how.” Conceptualization involves abstract thinking before doing. Planning involves testing initiatives to be prepared for use. Experience involves learning by doing, allowing learners to understand abstract concepts. There is a difference between individual learning and organizational learning (Sicilia, 2007). In individual learning, learners concentrate on information and knowledge, matching their proficiency levels and
satisfying their intellectual need. In organizational learning, learners need to focus on the collective interest of the shareholders. Organizational learning deals with "evolving perceptions," organizational visions, strategies, and knowledge transfer to the workplace. Senge (1994) defined organizational learning as "the continuous testing of experience, and the transformation of that experience into knowledge-accessible to the whole organization, and relevant to its core purpose" (p. 2). The concept of organizational learning has evolved since the 1990s (Easterby-Smith, Burgoyne, & Araujo, 1999).

Figure 2. Kolb learning cycle for organizational learning. (Modified from Sicilia, 2007, p. 17)

Organizational learning is often referred to a means of achieving organizational strategic goals. Finger and Brand (1999) described organizational learning as the "activity
and the process by which organizations eventually reach the ideal of a learning organization” (p. 136). Since learning is individual, the key question in organizational learning is to determine how individuals integrate their learning into organizational learning. The literature on organizational learning focuses on the analysis of both the individual and collective learning within the organization. A distinction should be made on the characteristic of learning. Learning can be viewed as a product or a process. Learning as a process focuses on how learners acquire knowledge, and learning as a product focuses on behavior.

The terms organizational learning and learning organization are often used interchangeably. Learning organization describes organizations structured to allow employees to acquire new skills, acquire and transfer knowledge, and modify behavior (Sicilia, 2007). Pedler et al. (1991) argued learning organizations are described as organizations making learning possible for all members and constantly renovating themselves. Watkins and Marsick (1992) defined learning organization where employees are engaged in a collaborative conduct, and “changes directed toward shared values or principles” (p. 118).

Evaluation in Organizations

As defined by Patton (1990), evaluation is the systematic collection of information about the activities, characteristics, and outcomes of a program to make judgments about the program, improve program effectiveness, and/or inform decisions about future programs. Stufflebeam (2001) also defined evaluation as a study designed and conducted to assist an audience to assess an object’s merit and worth. Evaluation is
important to an organization because it helps identify whether goals and objectives are achieved and their impact on the organization. Organizations use different models depending upon the focus of the evaluation. While there are a number of different evaluation models, those appropriate for evaluation of e-learning are reviewed and discussed below.

*Key Evaluation Checklist*

KEC (Key Evaluation Checklist), developed by Scriven (2007a), indicates many factors that should be of interest when conducting an evaluation. The purpose of the KEC checklist is to guide evaluators through the process of an evaluation. The checklist advises evaluators to:

1. Investigate the evaluand’s background and context, descriptions and definitions, consumers, resources, and values
2. Evaluate evaluand’s process, outcomes, costs, comparisons, and generalizability
3. Determine overall significance of the evaluation
4. Make recommendations when appropriate

The KEC has four major sections: (1) preliminary and information gathering; (2) foundations of the evaluation; (3) learning, outcomes, and costs; and (4) conclusions and implications (Scriven, 2007a). The KEC is used in this study to design a checklist for e-learning evaluation. KEC is explained in more detail in Chapter III, which addresses the checklist development methods. One of the characteristics of KEC is that it provides a wide array of checkpoints to guide the evaluator.
The Context, Input, Process, and Product (CIPP) model developed by Daniel L. Stufflebeam and colleagues in 1966 represents an alternative model for evaluating training programs (Stufflebeam, 2001, 2004, 2007; Stufflebeam et al., 1971; Worthen, Sanders, & Fitzpatrick, 1997, 2004; Ruhe & Zumbo, 2009). Although this evaluation model was introduced mainly for educational evaluation (Worthen et al., 1997, 2004; Stufflebeam, 2001, 2004, 2007; Stufflebeam et al., 1971), it has been applied in many different settings. The CIPP evaluation model provides a systematic way of looking at many different aspects of the process of a training program, as it has a decision-focused approach to evaluation (Quezada, 2005; Stufflebeam, 2000).

Stufflebeam (2000) viewed evaluation as the process of delineating, obtaining, and providing useful information for judging decision alternatives. The CIPP model provides managers and administrators with the information to support four different kinds of organizational decisions: (1) context evaluation to serve planning decisions; (2) input evaluation to serve structuring decisions; (3) process evaluation to serve implementation; and (4) product evaluation to help decide if the program should be terminate, sustained, or refocused (Worthen et al., 1997, 2004). In the context of the CIPP framework, evaluation is best described as “the systematic collection of information about the activities, characteristics, and outcome of programs for use by specific people to reduce uncertainties, improve effectiveness, and make decisions with regard to what those programs are doing and affecting” (Patton, 1986, p. 14). The four aspects of the CIPP
model are geared towards answering four basic questions: (1) What should we do? (2) How should we do it? (3) Are we doing it as planned? and (4) Did the program work?

The CIPP model has been used in educational settings as well as in organizations for training programs. However, it has not been as popular as the Kirkpatrick (1998) model for evaluating training programs because it originated in an educational context (Galvin, 1983; Worthen et al., 1997). The CIPP model is also not without its critics, who imply that the model has an idealized notion of what the process should be, rather than what it in actuality is. Also, some critics noted that it is top-down, or managerial, in its approach (Worthen et al., 1997).

*Balanced Score Card (BSC) Method*

Kaplan and Norton (1996) introduced the balanced score card (BSC) in the early 1990s. BSC is a management as well as measurement system permitting organizations to shed light on their vision and plan and put them into action (Kaplan & Norton, 1996; Quezada, 2005; Schniederjans et al., 2004). When using the balanced score card, organizations are viewed from four perspectives: (1) learning and growth, (2) internal business process, (3) customer, and (4) financial. The aim of BSC is to combine both financial and non-financial measures using tangible and intangible assets when evaluating performance. Traditionally, only financial measures were taken into consideration during a performance evaluation in organizations. Non-financial performance measures such as customer and/or employee satisfaction are a determinant in performance evaluation (Kaplan & Norton, 1992, 1993; Phillips & Stone, 2002; Schniederjans et al., 2004). The
four perspectives of the balance score card are interrelated and linked to the company’s strategic planning.

**BSC Four Perspectives**

As previously mentioned, organizations using the BSC model need to conduct their evaluation in four different areas (see Figure 3). Following is a description and the characteristics of the four perspectives:

1. *Learning and growth perspective:* Determine how organizations can keep up with innovation. Technology changes frequently and, to remain competitive, companies need to keep up advances and changes. Learning is also important so employees continue to improve their knowledge and skills. Companies can meet their goals through learning and growth.

2. *Internal business process:* Define the internal business process the company needs to have to do well and be successful. This is similar to the critical success factor, but in the production process. The three areas of success in an organization’s business process are innovation, operations, and post-sales services.

3. *Customer perspective:* Determine the company stands out from its competition by gaining new and retaining existing customers. Since customers are at the heart of any organization, it is essential for businesses to meet or exceed their expectations. The BSC model measures customers’ satisfaction and customer service and addresses customers’ concerns about price, quality, time, and service.
4. **Financial perspective**: Financial measures are used to determine how an organization is meeting its objectives. The financial perspective measures revenue growth, economic value added, income, internal rate of return, return on investment, profitability, and shareholder value.

*Figure 3. Balanced score card perspectives. (Modified version, Arveston, 1998)*

The advantage of BSC is the ability to include many components in the evaluation of performance. The main disadvantage, however, is the implementation of BSC is lengthy. E-learning evaluation can be conducted using all facets of the balanced score card.

*Return on Investment (ROI)*

Return on investment is an evaluation method used in organizations to measure what is gained as a result of an innovation, in this case, e-learning. The ROI method
focuses specifically on financial measures. ROI is traditionally used in the capital budgeting decision-making process, comparing the rate of return of an investment to the opportunity cost of capital (Schniederjans et al., 2004; Wen & Sylla, 2006; Zee, 2002).

ROI is an evaluation method used for tangible benefits. It includes three common methods: the net present value (NPV), discounted cash flow (DCF), and payback period. All three methods in ROI focus on the computation of the outcome of an investment. Based on the characteristics of ROI, it is clear the intangible benefits of the organization cannot be captured in this method. One of the drawbacks is ROI is designed to address only the hard, quantitative, and monetary impact of capital investment. However, other financial methods might be used to compensate for this lack of measure of intangible factors. Cost-benefit analysis (CBA) is one of the most popular financial methods used to overcome the problems of ROI.

Cost-Benefit Analysis (CBA)

Cost-benefit analysis is a financial measure used by organization to measure tangible as well as intangible benefits and overcome the problems in return on investment (Grembergen, 2001; Wen & Sylla, 2006; Zee, 2002). Wen and Sylla (2006) argued cost-benefit analysis has the ability to find "some surrogate measures for intangible benefits which can be expressed in monetary terms" (p. 8). Intangible benefits are difficult to measure in terms of dollar amounts. As defined by the new International Accounting Standard (IAS), intangible benefits are "an identifiable nonmonetary asset without physical substance held for use in the production or supply of goods and services, for rental to others, or for administrative purposes" (Grembergen, 2001, p. 160). Figure 4
identifies some intangible benefits. Murphy and Simon (2001) presented intangible benefits in technology evaluation in two broad categories: ongoing and future. Ongoing intangibles benefits are those that companies have already experienced (e.g., internal enhancement of organizations’ processes), and the future intangible benefits are opportunities companies can capitalize on and external to the organization, such as the market trends. Intangible benefits linked to external forces are the most difficult to measure (Murphy & Simon, 2001). Murphy and Simon proposed a technique to convert intangible benefits into monetary terms. Figure 5 illustrates the technique to bridge the gap between intangible and tangible.

Figure 4. Intangible benefits. (Murphy & Simon, 2001)
The value of cost-benefit analysis is based on the fact some organizational goals and benefits in projects cannot be quantified specifically in technology investment, and this method provides a vehicle to measure intangible benefits. Research has indicated an increase of intangible costs or benefits on companies’ balance sheet represents 35% of investors’ decisions. Murphy and Simon (2001) listed management credibility and quality, market share, quality of investor relations, and customer satisfaction as important intangibles.

The Success Case Method

The Success Case Model was introduced by Brinkerhoff (1983) as a training evaluation model. Originally the method was designed as a substitute for the Kirkpatrick levels of evaluation. In 2003, Brinkerhoff enhanced the model to make it a more functional evaluation model for training and innovation. This model is a practical way of determining the weaknesses and strengths of an initiative and identifying better ways of making the initiative work. Contrary to other evaluation models, the Success Case Model is not a comprehensive model but aims at promptly pointing out potential failures and successes of an innovation (Brinkerhoff, 2003). This method addresses four fundamental questions regarding the implementation of any initiative: (1) What happens during the
process? (2) What is the outcome as the result of using the initiative? (3) What is the significance of the initiative? and (4) How can it enhance the initiative?

Brinkerhoff (2003) proposed five steps to answer those four questions. The first step was to plan a success case study identifying the focus of the initiative. Second, an impact model should be constructed to represent what is expected as a representation of success. Third, surveys should be used to identify best and worst cases. Fourth, the findings of the surveys should be communicated. Fifth, conclusions based on findings and recommendations should be communicated.

In summary, the Success Case Model first identifies participants with a positive impact from the initiative, and then collects data on how success was achieved through the initiative. Casey and Doverspike (2005) argued the advantage of this method was that it offered an option to conduct a direct evaluation. The main disadvantage was the focus on training professionals' perspectives about elements of the success factor, undermining problems learners might have with the initiative.

Online Learning Evaluation

As defined in the previous chapter, e-learning is the use of technology to deliver instruction. E-learning has been introduced as a learning tool in organizations over the past several years and continues to grow. E-learning allows employees to learn using the computer at work instead of traveling to classrooms. Organizations move to e-learning as a delivery method from the traditional face-to-face because of the flexibility, accessibility, and convenience it offers (Driscoll, 2002; Galvin, 2002; Henderson, 2003; Sicilia, 2007; Smart & Cappel, 2006; Yaw, 2005). Flexibility allows learners to use a learning module
anytime and not be restricted to a specific learning schedule. E-learning can also be accessed from any location as long as the learner can connect to the learning system. As Sicilia (2007) noted, e-learning allows different ways of learning, whereas the traditional face-to-face classroom does not. Sicilia indicated learners engaged in e-learning need to be committed to learning and willing to use the new process for learning. Sometimes there is a lack of motivation and discipline on the part of employees and they do not complete online courses (Pfeifer, 2004; Zielinski, 2000). Research indicates approximately 60% to 80% of employees signing up for an online course never started or completed their training (Garner Group, 2000; Pfeifer, 2004; Zielinski, 2000).

In organizations, e-learning is also referred to as training. As e-learning grows in organizations, it is critical to conduct evaluation to determine the effectiveness of the learning program. Organizations use different methods to evaluate e-learning. Usually, organizations will use one method of training evaluation to evaluate e-learning. This study has identified several e-learning evaluation methods.

*Kirkpatrick’s Model*

The most well-known and prominent model for evaluating training programs was proposed by Donald Kirkpatrick (Bichelmeyer & Horvitz, 2006; Kirkpatrick, 1998; Kirkpatrick & Kirkpatrick, 2006; Worthen et al., 1997). According to Stone and Watson (1997), approximately 67% of organizations conducting evaluations utilize different facets of the Kirkpatrick model. Kirkpatrick (1998) suggested training should be measured at four levels: Level 1, reactions; Level 2, learning; Level 3, behaviors; and Level 4, results.
Level 1, reaction, is also called a smile sheet. Learners or trainees are requested to evaluate the program. This level aims to determine how participants liked the training and their level of satisfaction. In e-learning, a survey for Level 1 can be conducted online. Kirkpatrick and Kirkpatrick (2006) suggested features such as built-in polling be used to get instant feedback from participants on the appearance and delivery quality of training. Course discussion forums, chats, or instant messaging for focus group can be used as well to gather feedback from participants on how they liked the e-learning experience (Horton, 2001).

Level 2, learning, is a measure of how learners or trainees change their attitudes, improve knowledge, and enhance skills as a result of participating in a training program. The concern at this level is to determine if participants learned anything during training (Kirkpatrick, 1998; Kirkpatrick & Kirkpatrick, 2006). Level 2 evaluation measures how effective the training method is in enhancing knowledge and/or affecting attitude. Evaluating learning (Level 2) is more complex, and takes more time than reaction evaluation (Level 1). Kirkpatrick and Kirkpatrick (2006) suggested the following guidelines:

1. A control group can be used when possible.
2. Pre- and post-assessment of knowledge, skills, and/or attitudes should be conducted.
3. A manual test should be used to assess both knowledge and attitudes.
4. Skills should be measured with a performance assessment.
5. 100% response rate is ideal.
6. Make decisions based on the results of the evaluation.
E-learning Level 2 evaluations are easy to conduct because automated tools can be used to administer, score, and report tests scores. Programs such as Captivate (http://www.adobe.com), and Question Mark Perception (http://www.questionmark.com) are tools to create and deliver tests. Table 2 below provides a listing of possible tools to be used in testing the outcomes of e-learning.

Table 2

<table>
<thead>
<tr>
<th>Testing Tools</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tools That Can Create Tests</td>
</tr>
<tr>
<td>Lectora Publisher/ Lectora.com</td>
</tr>
<tr>
<td>Captivate / Adobe.com</td>
</tr>
<tr>
<td>ToolBook Instructor/ Sumtotalssystems.com</td>
</tr>
<tr>
<td>Authorware/Adobe.com</td>
</tr>
<tr>
<td>Trainersoft/outstart.com</td>
</tr>
</tbody>
</table>

Source: Kirkpatrick & Kirkpatrick (2006)

Level 3, behavior change, is also known as transfer of training and attempts to measure how trainees have changed their behavior as a result of knowledge gained in training (Amsel, 1989; Baldwin & Ford, 1988; Broad & Newstrom, 1992; Kirkpatrick, 1998). Kirkpatrick (1998) also felt it was important to determine whether the knowledge, skills, and attitudes learned in the training program were transferred to the job. However, recent studies have indicated there is no significant relationship between what is learned and behavior change on the part of training participants using the Kirkpatrick model.
(Bledsoe, 1999; Frash, 2004; Yaw, 2005). Level 3 evaluation can be conducted with the same means used in both e-learning and classrooms. This type of evaluation occurs outside of the learning setting; however, electronic means can be used in e-learning evaluation (Horton, 2001).

Level 4, results, is defined by the impact of the training on the organization. Is there a change in the business as a result of the training? Results might include increase in productivity, increase in sales, decreased costs, and higher profits or return on investment (ROI) (Kirkpatrick, 1994; Kirkpatrick & Kirkpatrick, 2006; Winfrey, 1999). According to Horton (2001), e-learning evaluation at Level 4 is more difficult than classroom learning. Inquiring about the value of e-learning from trainees, supervisors, customers, and clients can help in evaluating e-learning results (Kirkpatrick & Kirkpatrick, 2006).

Phillips’ Five-Level ROI Framework

Another method for e-learning evaluation suggested by Strother (2002) is Phillips’ five-level model. Phillips (1997) built on Kirkpatrick’s four-level model by adding a fifth level, return on investment (ROI). ROI is a financial analysis method used to measure the impact of program and procedures on organizations (Phillips, 2003; Phillips & Stone, 2002; Sibbett, 1997). ROI determines the profitability of organizational resources and makes comparisons between the rate of return on investment and the opportunity cost (Schniederjans et al., 2004). The intent of Level 5 is to convert into monetary values the measures found in Level 4 (Phillips, 1996, 1997; Phillips & Stone, 2002). Kirkpatrick’s Level 4 has been criticized for a lack of real financial value (Phillips & Stone, 2002).
Another compelling reason why Phillips (1997) added a fifth level is to separate results of the impact of actual learning on job behavior from the impact of financial resources.

Phillips' five-level model has been instrumental in allowing a step-by-step evaluation model to include tangible and intangible benefits (Phillips, 1996, 1997; Phillips & Stone, 2002). According to Phillips (1997), savings can be measured by comparing the costs of both training methods, e-learning and traditional learning programs. Cost saving, such as lower travel expenses and instructors' salaries in e-learning programs, can highlight return on investment in e-learning programs. ROI attempts to determine the amount of return on investment organizations receive from implementing training.

**E-Learning Evaluation Outcomes-Based Model**

An e-learning evaluation model was developed by O'Connor (2006). The model evaluates e-learning based on five dimensions (see Table 3).

According to O'Connor (2006), each one of the five dimensions of evaluation is relatively legitimate. Evaluation should be prioritized based on who requested or needs the results of the evaluation. O'Connor argued the sequence of the five dimensions of the evaluation can vary greatly depending on users. Some may see the quality of the design as the basis for e-learning effectiveness, while others might think of usability as the significant factor in learning improvement.
Table 3

_E-Learning Five Dimensions_

<table>
<thead>
<tr>
<th>Dimension</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Design Evaluation involves:</td>
<td>Problem analysis, needs assessment, learning objectives, instructional strategies, content organization, media and learner interactions</td>
</tr>
<tr>
<td>2. Usability evaluation involves:</td>
<td>Learner’s satisfaction with site navigation, and design</td>
</tr>
<tr>
<td>3. Learning Evaluation involves:</td>
<td>Learners’ knowledge and skills gained as a result of e-learning.</td>
</tr>
<tr>
<td>4. Efficiency Evaluation involves:</td>
<td>Time and cost saving. Are learners able to accomplish more in less time.</td>
</tr>
<tr>
<td>5. Effectiveness evaluation involves:</td>
<td>Determining behavioral change on the job as a result of e-learning.</td>
</tr>
</tbody>
</table>

_Usability Evaluation Method for E-Learning Applications_

The model of e-learning usability evaluation was developed by Zaharias (2005). This model aimed at asynchronous learning program for corporate training. The foundation of this framework lies in the human-computer interaction. Zaharias (2004, 2005) has identified poor usability of e-learning applications as the main reason for a high dropout rate in e-learning programs. According to Zaharias (2005), there is a direct link between the design of e-learning programs and “their pedagogical value” (p. 1); therefore, methods that were traditionally used to measure efficiency, effectiveness, and satisfaction of usability cannot be adapted to all e-learning programs. In order to establish new methods of usability measurement, this model includes learner affect. In this model, the user is identified as learner, and the motivation to learn is used as the measurement tool.
for e-learning usability. The model uses three instructional designs and Web usability as predictors for motivation to learn.

The framework has seven dimensions: content, learning and support, visual design, navigation, accessibility, interactivity, and self-assessment and learnability (see Table 4). This model could be used for both formative and summative evaluation (Ruhe & Zumbo, 2009). A questionnaire based on this model has been psychometrically tested and can be used to evaluate e-learning programs. Using the questionnaire, the evaluator can run a regression model and determine if the e-learning program predicts learning motivation. The model has been empirically tested on two asynchronous e-learning courses covering “IT Business Consultancy” and “Software and Application Development.”

Table 4

*Usability Design Dimensions*

| 1. Content | Whether or not the terminology and concepts used are appropriate for the learners |
| 2. Learning and Support | Whether or not the course provides tools and activities that support learning |
| 3. Visual Design | Are font, colors, and style easy to read on the screen and on hard copy |
| 4. Navigation | Is the course easy to navigate? Can users go to modules without problems? |
| 5. Accessibility | Are there technical problems such as hyperlinks and programming errors? |
| 6. Interactivity | Are there simulations and role playing activities to motivate learners? |
| 7. Self-assessment & Learnability | Can learners start the course with online assistance only |
Quality Framework Five Pillars

This model was proposed by Lorenzo and Moore in 2002. This model uses the five pillars as principles of quality for e-learning evaluation. The five pillars are:

1. *Learning effectiveness*: The program provider has to show that the quality of e-learning program is comparable to that of the face-to-face program.

2. *Cost effectiveness and institutional commitment*: E-learning can be used as a cost reduction, even though services are improved.

3. *Access*: Potential e-learners should have the program available for use.

4. *Faculty (employees) satisfaction*: Faculty achieve success with teaching online.

5. *Students' (customers) satisfaction*: Students are pleased with their online experience and achieve success.

The Five Pillars Model can be used for both education and organizations. One specific aspect to this model is that it provides metrics for establishing benchmarks and standards in e-learning evaluation. While using this model, organizations can set their own set of standards for each pillar. Quality is relative to organizational goals and mission.

The Hughes and Attwell's E-Learning Evaluation Framework

Hughes and Attwell (2003) have identified five major clusters of variables through numerous e-learning project evaluations: (1) individual learner variables,
(2) environmental variables, (3) technology variables, (4) contextual variables, and (5) pedagogic variables. Each one of the five groupings has individual variables.

Variables for the first category, individual learner variables, consist of physical characteristics such as demographics, like age and gender (Hughes & Attwell, 2003; Omwenga & Rodrigues, 2006; Ruhe & Zumbo, 2009); and learning history such as learning outcome, learner's attitude, motivation, and knowledge of technology. Included in the second cluster, environmental variables, are learning, organizational/institutional, and subject environment. The third category, technology variables, applies to the type of hardware, software, connectivity, media, and mode used to deploy e-learning. Contextual variables, which is the fourth cluster, comprises socioeconomic factors, the political context, and cultural background. Finally, the fifth category, pedagogic variables, addresses issues related to the learner support. These include how accessible the program is, the type of methodology utilized, flexibility, assessment and examination, learner autonomy, selection and recruitment criteria, as well as accreditation and certification.

Hughes and Attwell (2003) noted the need to come up with a classification system that should identify different levels of aggregation. This model has not been fully tested for validity.

**Technology Mediated Learning Evaluation Framework**

This model, proposed by Omwenga and Rodrigues (2006), has three main levels: (1) technical system, (2) human perspective, and (3) education system. The basis for this model is that any technology used for educational purposes has a three-structure framework that includes structure (e.g., design), process (modalities to achieve learning),
and outcome (learning impact) (SPO). In this model, SPO can be applied to all three main levels. Table 5 shows the levels and their components.

Table 5

<table>
<thead>
<tr>
<th>Three Levels of Technology Mediated Learning Evaluation Framework</th>
</tr>
</thead>
<tbody>
<tr>
<td>Level 1: The System’s Functioning</td>
</tr>
<tr>
<td>Technical aspect, efficiency of the system,</td>
</tr>
<tr>
<td>hardware and software structure</td>
</tr>
<tr>
<td>Level 2: Human perspectives</td>
</tr>
<tr>
<td>How stakeholders view the system, and how it</td>
</tr>
<tr>
<td>affect them. Stakeholders include the user/instructor,</td>
</tr>
<tr>
<td>learner, and the administrator</td>
</tr>
<tr>
<td>Level 3: Education system</td>
</tr>
<tr>
<td>Impact of the e-learning program on the education system.</td>
</tr>
<tr>
<td>Does e-learning affect the quality of the education?</td>
</tr>
</tbody>
</table>

The Unfolding Model: Scientific Evidence Unfolded

The Unfolding Model, which used a comprehensive approach to evaluation, was developed by Ruhe and Zumbo (2009). According to Ruhe and Zumbo, this model is adaptable to diverse technologies and delivery modalities. The reasoning for that feature is based on two major factors: (1) technology is constantly changing, and (2) evaluators can select the tools that best fit their needs and apply them to their evaluation. Ruhe and Zumbo reviewed a number of evaluation models used for e-learning and distance education. The models were grouped in two categories: (1) models based on “scientific evidence, values, and consequences” (Ruhe & Zumbo, 2009, p. 42), and (2) “models based on evidence, values, and consequences” (Ruhe & Zumbo 2009, p. 50). Models focusing on scientific evidence include: outcome, relevance, and cost-benefit analysis (see Table 6 for description of scientific evidence models). Eight models with scientific
evidence have been described; some of those models have been described in previous paragraphs:

3. ACTION Model (Bates, 1995)
6. The e3Learning Model (Lam & McNaught, 2005)
7. A Model of E-Learning Usability and Learner Affect (Zaharias, 2005)
8. The CIAO Model (Scanlon, Jones, Barnard, Thompson, & Calder, 2000).

Table 6

Models with Scientific Evidence Components

| 1. Outcomes | Quantitative data on learning outcomes, completion rate, learning satisfaction ratings, interview and survey responses on learner satisfaction |
| 2. Relevance | How course content relates to society needs, course materials authentication, and transfer of learning to the real world |
| 3. Cost-benefit | Cost of the course in relation to the benefits, efficiency, or effectiveness |

Source: Ruhe & Zumbo (2009)

The second category, Models Based on Evidence, Values, and Consequences, has seven models. Those models are characterized by two factors: (1) underlying values, and (2) unintended consequences. Underlying values are theory, ideology, and stakeholders’
value. Unintended consequences are unexpected effects of the program in reference to instructional and social aspect. The seven models are:

1. Gooler (1979)
5. Mann (1998)
6. The Five Pillars of Quality Framework
7. Design-Centered Evaluation Architecture

Based on their comprehensive review of the existing models for evaluation of e-learning and distance learning, Ruhe and Zumbo (2009) developed the Unfolding Model, which has four major components: (1) scientific evidence, (2) relevance/cost-benefit, (3) underlying values, and (4) unintended consequences.

1. Scientific evidence: This involves using mixed method of data collection (i.e., quantitative and qualitative). Both data collection methods can be accomplished through surveys, interviews, focus groups, or online ethnographies.

2. Relevance/cost-benefit: Relevance determines how the course is aligned with education and training needs and how learners relate to the course and their ability to learn and transfer knowledge and skills learned in the real world. Cost-benefit analysis compares costs and benefits and uses both tangible and intangible.
3. **Underlying values:** This section identifies the value that underlined the course. Those values could include goals and objectives of the course, innovation, ideology, and theory.

4. **Unintended consequences:** This determines the gap between what is expected from the program and what is actually happening. Unintended consequences can be instructional (i.e., bugs, glitches, high attrition rates, redundant course materials), or social (i.e., learner isolation, less privacy).

**Summary**

Chapter II has provided an overview of the literature relevant to the study. Fundamental issues (evaluation methods in organization and e-learning evaluation models) have been covered. It was apparent throughout the literature that e-learning implementation in an organization can be impacted by multiple factors, internal as well as external. Evaluating e-learning is similar to evaluating training in organizations, and existing models of training evaluation can be used to conduct e-learning evaluations. The literature review addressed appropriate evaluation models and provided the strengths and weaknesses for each model when conducting an e-learning evaluation. Previous evaluations of e-learning and the literature will serve to inform the development of a framework for e-learning evaluation.
E-Learning Evaluation in Organizations Checklist Approach

E-learning is playing a greater role in organizations seeking to train their employees to learn the skills necessary in an ever-changing climate of a global world (Galvin, 2002; O’Connor, 2006; PrimeLearning, 2001; Smart & Cappel, 2006). With the amount of funding being poured into e-learning, it is necessary to conduct evaluations of e-learning in organizations to determine the effectiveness of these learning programs for individuals and organizations. A number of different evaluation models can and have been used to measure effectiveness and worth of programs. However, the literature indicates the evaluation of e-learning may need to develop new models for evaluation (Driscoll, 2002; Kathawala & Wilgen, 2004; O’Connor, 2006; Sloman, 2002).

Typically, financial methods have been used to evaluate e-learning, ignoring other factors important to the effectiveness of e-learning (O’Neill, Singh, & O’Donoghue, 2004; Smart & Cappel, 2006; Wang, 2003). Since the investment in e-learning is considerable, it is understandable that financial measures are the biggest concern of organizations. Organizational culture, employees’ readiness and motivation, and hardware and software implementation are all crucial to the effectiveness of e-learning, and these factors also need to be considered as part of any evaluation (Kathawala & Wilgen, 2004; O’Connor, 2006; Rosenberg, 2001; Smart & Cappel, 2006; Wang, 2003).
An evaluation checklist is one approach to help evaluators ensure that all of the elements necessary for an e-learning evaluation are included, as they are often overlooked (Scriven, 2000). This study will develop a checklist as a tool to help address the challenges of e-learning evaluation in organizations. Chapter III provides an overview of checklists, characteristics of evaluation checklists, usability and development, and the methodology to be used in developing an e-learning comprehensive checklist (ELEC) for e-learning effectiveness evaluation in organizations.

Checklists Definition

Checklists are mnemonic devices used in evaluation to help evaluators address all the important factors related to the object of the evaluation (Scriven, 2007b). Checklists are lists or inventories of “factors, properties, aspects, components, criteria, tasks, or dimensions” (Scriven, 2000, p. 1) that need to be judged individually while accomplishing a specific job. Stufflebeam (2000) noted checklists have been used since the early days of evaluation and are valuable tools for evaluation, even though they are regarded as an “entry-level” type of methodology (Scriven, 2000, p. 1).

Types of Checklists

Checklists can be grouped in six major categories: (1) laundry list, (2) strongly sequential, (3) weakly sequential, (4) iterative, (5) diagnostic, and (6) comlist (Scriven, 2007b) (see Table 7).

The laundry list is the mnemonic type of checklist and the order of the items is irrelevant. The validity of the checklist is not impacted by the order of the items.
Table 7

Types of Checklists

<table>
<thead>
<tr>
<th>Categories</th>
<th>Validity</th>
<th>Examples</th>
</tr>
</thead>
<tbody>
<tr>
<td>Laundry List</td>
<td>Order of items is irrelevant. Items need to be put in right categories</td>
<td>Grocery list</td>
</tr>
<tr>
<td>Strongly Sequential</td>
<td>Order of items is very important as well as their categories and groups</td>
<td>Preflight checklist</td>
</tr>
<tr>
<td>Weakly Sequential</td>
<td>Order of items is somewhat important. Categories and groups need to be well defined</td>
<td>Product advertisement checklist in marketing</td>
</tr>
<tr>
<td>Iterative</td>
<td>Order of items somewhat important. Checkpoints needs to be used multiple times</td>
<td>System prototype testing checklist</td>
</tr>
<tr>
<td>Diagnostic</td>
<td>Based on flowcharts Order of items is sometimes important</td>
<td>Patient health condition checklist</td>
</tr>
<tr>
<td>Comlist (Criteria of Merit)</td>
<td>Use criteria to determine the value of evaluand</td>
<td>Determining a winner in a competition</td>
</tr>
</tbody>
</table>

Source: The Logic and Methodology of Checklists (Scriven, 2007b)

However, items need to be grouped in categories and it is important for entities to be entered in the correct category. An example would be a grocery list, where all items will be grouped by categories and the order in which they are acquired is irrelevant.

Sequential checklists have two subcategories: strongly and weakly sequential. The order of the checklist items matters in both subcategories. In the strongly sequential checklist, the order of checkpoints should be followed logically. A preflight checklist is an example of a strongly sequential checklist (Scriven, 2007b, p. 1). In that instance, all instruments in the aircraft are checked in a particular order to find out if the aircraft is ready for take-off. In contrast, the weakly sequential checklist follows an order based on
“psychological or efficiency reasons rather than from logical or physical necessity” (Scriven, 2007b, p. 2). A checklist for new product promotion, for instance, uses a sequential order based on customers’ behaviors and market trends. In this instance, the sequence is based on the fact that customers might be inclined to purchase a new product if they know its features, so instead of giving the price of an item first, the checklist will have the quality of the product, compare it with existing products, and then quote the price.

Iterative checklists are somewhat sequential and require checkpoints to be revisited multiple times before validation (Scriven, 2007a). The Key Evaluation Checklist (KEC) is an example of an iterative checklist, because it is used more than once during the process (Scriven, 2007a). Also, in the developmental stage for a new system, designers make a prototype—smaller version—to test the new system model. In order to check the usability and functionality of the new system model, an iterative checklist is used to test the prototype. It is imperative the prototype be used multiple times to identify areas not working properly.

Diagnostic checklists are sometimes sequential and are based on flowcharts to draw fundamental conclusions. The diagnostic checklist is, in a way, a trouble-shooting process and the “if-then-analysis” is applied, leading to causal conclusions. Professionals such as taxonomists, mechanics, and toxicologists often used diagnostic checklists (Scriven, 2007b). Toxicologists will run a battery of tests in a particular order on an individual and base their findings on the results of all the tests. They can then draw a conclusion about the condition of the person.
Lastly, the criteria of merit (comlist) is the primary type of checklist used in evaluation studies. In comlists, criteria are given weights and judgment about evaluands is made based on the weight accumulated. Criteria are properties, attributes, or features of evaluands used in the evaluation to determine the impact, value, and effectiveness of the evaluands (Davidson, 2005). Criteria are determined based on knowledge and expertise in the field of the evaluand. Numerical weight and sum (NWS) is a procedure used in comlists. First, criteria are determined, then given a weight (i.e., performance score). In a competition, for example, comlists are used to evaluate participants' performance, and NWS is used to tally scores for each candidate and determine the winner. The procedure does have some drawbacks because it can exclude qualitative data (Davidson, 2005; Scriven, 1991). However, qualitative weight and sum (QWS) can be used to incorporate qualitative data. Scriven (1991) developed the QWS method to tally the performances of an evaluand based on multiple criteria in determining overall merit or worth. It is a ranking methodology for determining the relative merit of many evaluands. As Davidson (2005) noted, it is important to use qualitative as well as quantitative data in determining performance on criteria of merit. Methods such as rubrics (tools describing performance) should be used instead to include both qualitative and quantitative data in the evaluation process (Davidson, 2005). Two types of rubrics can be used: a grading rubric and a ranking rubric. Grading rubrics can be used to determine quantitative value, and a ranking rubric can be used to determine qualitative value (Davidson, 2005).

Scriven (2007b) noted comlists are difficult to develop and validate, as they have to meet rigorous requirements such as identifying all significant criteria of merit and making sure the criteria do not overlap; otherwise, scoring will be erroneous.
Checklists are useful tools for evaluation as they help evaluators monitor criteria to be considered during an evaluation process. House and Howe (2000) emphasized how checklists can be of great use in complex evaluations. Wingate (2002) also noted evaluations address a variety of aspects and suggested even the most basic type of checklist (e.g., laundry list) might be useful in conducting an evaluation. Checklists have been used in numerous evaluations and have been considered a helpful tool. Examples of checklists are posted on the evaluation checklist Web site (www.wmich.edu/evalctr/checklists). The checklist Web site was set up by the Evaluation Center at Western Michigan University through the Project MTS, funded by the National Science Foundation (NSF). The goal of this project was “to enhance evaluation capacity in the science, mathematics, engineering, and technology education communities through materials development, training, and support services” (Wingate, 2002, p. 1). The checklist Web site’s objective is to make the evaluative tools available through the World Wide Web to the evaluation community (Wingate, 2002). The checklist Web site has more than 30 checklists in various categories posted. One checklist addresses the institutionalization of technology in schools (Nelson, Post, & Bickel, 2001). This is a sequential checklist evaluating the capacity to use technology effectively in schools. Another checklist titled A Checklist for Building Organizational Evaluation Capacity (Volkov & King, 2007) is posted on the checklist Web site and provides guidelines for incorporating evaluation regularly in an organization. Other useful checklists developed by well-known evaluators such as Stufflebeam (2000, 2001, 2007) and Scriven (2000,
2005, 2007a) have been posted on the checklist Web site as well. Through the literature review, other checklists have been identified, and even though they are not on the checklist Web site, they have been useful in the development of the ELEC. The Organizational Evaluation Checklist (OEC) (Martz, 2008) is an iterative and weakly sequential checklist used as a tool in evaluating organizational evaluation effectiveness. Persaud (2007) developed an iterative checklist, Cost Analysis Checklist, designed to help new evaluators and others in conducting cost-benefit studies. The Sustainability Evaluation Checklist (SEC), developed by Schröter (2008), is an iterative weakly sequential list using features of the laundry list as well as criteria of merit and is intended to be used in evaluations of the sustainability of social and international development programs and projects. Checklists are, in general, easy to use; they are systematic and incorporate factors important to evaluations that might have been neglected or forgotten.

*Strengths and Weaknesses of Checklists*

*Strengths of Checklists*

1. Checklists are mnemonic devices that remind the evaluators what to do, look for, and check. The mnemonic characteristic of checklist helps in reducing errors and minimizing the chance of overlooking important evaluation criteria.

2. Checklists are user-friendly, easy to use and understand. This is important and advantageous for stakeholders not familiar with some theories or statistical analysis. Checklists provide step-by-step instruction on how to carry out a task.
3. Checklists help create consistency, completeness, and objectivity through the process of evaluation by allowing evaluators to give consideration to all criteria.

4. Checklists help improve validity, reliability, and credibility of an evaluation in covering a substantial amount of information, as well as knowledge about a domain.

5. Checklists can also be cost-effective, though, and efficient. Checklists reduce the amount of time to accomplish a task since the steps have already been laid out and the time saved has monetary value (Persaud, 2007).

*Weaknesses of Checklists*

Despite all the strengths of checklists, there are also potential weaknesses to the methodology. Even though the literature did not have a great deal of information on the weaknesses of checklists, the following are some disadvantages of checklists:

1. A key weakness of checklists is they may undermine evaluators’ creativity. This is known as tunnel vision, a process in which users strictly follow the checklist without thinking about its inadequacy or surrogate uses.

2. Sometimes checklists can have flaws and users may not be able to identify the mistakes; therefore, results from checklists could be inaccurate, leading to incorrect decisions.

3. Since checklists are knowledge-dependent, they do require knowledge about the area of the evaluation, and training in using the checklist content is
necessary. Checklists cannot substitute for prerequisite training and knowledge.

Methodology for Developing the E-Learning Evaluation Checklist

The E-Learning Evaluation Checklist (ELEC) will help evaluators as well as information technology and e-learning professionals in evaluating e-learning in organizations. ELEC will use a systematic process to evaluate e-learning in the organization and address factors lacking in current evaluation models of e-learning. Although there are many methodologies for developing checklists, this study uses the Checklist Development Checklist (CDC) (Stufflebeam, 2000) as the guideline for developing the checklist ELEC. Stufflebeam (2000) designed guidelines for developing evaluation checklists based on more than 30 years of developing and using checklists. This approach utilizes a process of addressing 12 major checkpoints and sub-checkpoints. The process for development does not address any scoring procedure. Criteria selection is based on the review of literature on e-learning use and evaluation in the organization. Other relevant areas of the literature review focused on organizational learning, organizational evaluation, and innovation.

Following are the 12 major checkpoints, their brief descriptions, and how they will be use in the development of ELEC.

1. **Focus the checklist task.** This checkpoint identifies the evaluand, the object of the evaluation, and the target of the evaluation. The checklist developer should use his or her experience, experts' advice, and a literature review to develop the knowledge base. It is necessary at this checkpoint to explain and
provide a valid reason for criteria to be met in the checklist and lay out the foundation for the checklist. In the development of ELEC, this checkpoint was used to describe and define e-learning in an organization. Criteria for the checklist was determined based on the literature review and professional experience.

2. Make a candidate list of checkpoints. This step involves gathering the list of checkpoints and descriptors of the criteria. The checklist developer needs to define each descriptor. In this stage, factors such as categorization, weighting, and scoring procedure are not important. This stage requires a great deal of creativity and thinking. At this stage of ELEC development, a preliminary list of relevant checkpoints for e-learning evaluation was drawn, and the description of criteria was provided.

3. Classify and sort the checkpoints. Since the previous step randomized the list of checkpoints, this step aims at organizing the checkpoints. This can be done by classifying and sorting checkpoints by main categories. This process allows the checklist developer to identify errors such as gaps and overlaps, as well as strong points or flaws. Once those are identified, corrections or modifications can be made easily.

4. Define and flesh out the categories. Once the main categories have been identified, it is important to define them. In this process, categories as well as their main idea should be defined. At the same time, validation should be provided for the significance of each category. During this process, checklist developers can edit some checkpoints, if necessary.
5. *Determine the order of categories.* This step creates the sequence for the checkpoints. The developer has to identify the order of the checkpoints and categories of the checkpoints. The sequence has to be checked for functionality and logical order.

6. *Obtain initial reviews of the checklist.* This is a review stage. Potential users of the checklists should provide feedback based on the review version prepared by the checklist developer. A follow-up with reviewers will provide in-depth information on the feedback.

7. *Revise the checklist content.* In this step, the early revision done by independent reviewers should be revised by the checklist developer. The developer should make sure the changes are valuable and will improve the checklist.

8. *Delineate and format the checklist to serve the intended use.* The checklist should be formatted for user-friendliness. A checklist that is simple to use and easy to understand will be more practical for evaluators.

9. *Evaluate the checklist.* The checklist developer should conduct a comprehensive evaluation following three major steps. The reviewers or potential users should provide critiques of the checklist in writing. Following this, intended users should implement the checklist in a formative and summative evaluation. Lastly, the value and functionality of the checklist should be summarized based on feedback of the reviews and testing.

10. *Finalize the checklist.* This stage involves the refinement of the checklist and the publication of the final version.
11. *Apply and disseminate the checklist.* The checklist developer makes the checklist available for use. This should be done through the primary intended users first, then through a wider audience.

12. *Periodically review and revise the checklist.* Checklists should be revised frequently as users provide recommendations and suggestions for the improvement of the checklist. (Stufflebeam, 2000)

**Checklist Formatting**

An important element in the checklist development is the formatting listed in step 8. Formatting is an important factor. For instance, in a field such as accounting and finance, graphs, charts, and tables enhance the documents and make them easy to understand for the end user. In evaluation, good formatting allows clarity and ease of use. A checklist should be formatted based on the intended users. Bichelmeyer (2003) developed a checklist for formatting checklists (CFC). This checklist provides guidelines to evaluators for structuring and presenting checklists. The CFC covers five categories essential to checklists formatting: context, content, structure, images (if necessary), and usability.

**ELEC Checklist Development Process**

ELEC is an iterative sequential checklist requiring multiple passes to identify and correct problems if necessary; this also avoids duplication of the same criteria. E-learning, as part of technology, is a specific domain requiring a great deal of understanding, and evaluators may need training if they are not familiar with technology to use the ELEC
checklist. The checklist is not a substitute for training. In order to use the checklist appropriately, evaluators need to understand important issues in the area of information technology. ELEC is designed to be used in all organizations; however, the criteria of merit and measures used may differ based on the organization type, goals, and specific needs. ELEC is built upon the KEC (Key Evaluation Checklist) (Scriven, 2007a). Scriven provides several factors to be looked at and investigated during evaluations of programs, projects, and organizations. The checklist advises evaluators to (1) investigate the evaluand's background and context, descriptions and definitions, consumers, resources, and values; (2) evaluate the evaluand's process, outcomes, costs, comparisons, and generalizability; and (3) determine overall significance and, if appropriate, make recommendations.

ELEC has four major sections: (1) preliminary and information gathering; (2) foundations of the evaluation; (3) learning, outcomes, and costs; and (4) conclusions and implications (see Figure 6).

Overview of the ELEC Checklist

The following explains the different checkpoints and their rationale for e-learning evaluation.

Section 1: Preliminary and Information Gathering

In this phase, information is gathered to help in planning the evaluation of e-learning program. Discussions should be held with participants and other interested persons about the evaluation of the e-learning program. Topics for discussion include
Figure 6. ELEC framework. (Source: Key Evaluation Checklist, Scriven, 2007a)

The purpose of the evaluation, resources available, timeframe, as well as the data and information needed for the evaluation. This step sets the foundation for the evaluation. It is useful for the design and execution of e-learning evaluation. The following checkpoints are included in this section:

1.1. **Identify the client and contact person for the evaluation.** The client is the person that officially requests the evaluation. In the e-learning evaluation, it may be the person responsible for the e-learning program or management. The point of contact for the evaluation will be the person of liaison between the evaluator and the client. This is necessary for the evaluator to know whom to contact and report to. Sometimes the person requesting the evaluation could be the primary contact as well.
1.2. *Clarify the purpose and intended users of the evaluation.* The purpose of the evaluation is to identify questions to be answered. The intended users will specify how the evaluation will be used; This helps the evaluator draft the evaluation questions.

1.3. *Identify the prospective audience.* The audience of an evaluation is similar to consumers (Scriven, 1991). This includes those who should be informed of the evaluation, either during the process or at the end of the evaluation. The audience may include those who are or are not being evaluated. In an e-learning program, the audience will be end-users of the program, management, those who design and implemented the program, and the trainers.

1.4. *Identify stakeholders in the program.* Stakeholders include anyone affected by the program to be evaluated or by the results of the evaluation. This includes the client who requests the evaluation, the end users of the program, the management team, and anyone who will be involved in the evaluation process.

1.5. *Identify the nature and type of evaluation.* The evaluation request could be to determine the financial worth of the program, and more attention will be given to cost analysis. In the case of e-learning, greater attention may be given to the return on investment (ROI) and the cost-benefit analysis (CBA). If the request is for merit, in this case, greater emphasis is put on the success or failure of the program. The evaluation can be either formative or summative. A formative evaluation could be requested to identify areas of improvement in an e-learning program; this is done when the program is new. The evaluation requested could be summative, in which case the results of the evaluation could be used to determine if goals of the e-learning program have been attained, which
will lead to a decision to sustain or discontinue the program. Formative and summative evaluations are mutually exclusive.

1.6. *Specify the timeframe to be used for the evaluation.* The timeframe will determine which phase of the e-learning is of interest for the evaluation. The timeframe could be either the beginning, the middle, or the end of the program life cycle. Effectiveness criteria will be different when conducting the evaluation at different stages of the program life cycle. The timeframe of interest could also be a short-term evaluation, for an e-learning evaluation could be conducted after a year, and a long-term evaluation could be conducted up to three years. The three-year timeframe is reasonable for and e-learning program to determine its effectiveness.

1.7. *Conduct a feasibility assessment of the evaluation.* This stage is aimed at determining if the evaluation can be conducted based on the information gathered and the goal to attain. This allows the evaluator to find out the feasibility of the evaluation based on information collected. According to Wholey (1994), four basic questions should be addressed when conducting an assessment of an evaluation:

1. What are the goals of e-learning program?
2. Are those goals plausible?
3. What are the measures needed? And are they available?
4. How will the evaluation be utilized?

In addition to Wholey's four components of feasibility, the ELEC checklist also includes budget and time in the feasibility assessment. Budget and time are interconnected when conducting a feasibility study.
Scriven (2007b) also addressed the applicability of the evaluability assessment. As Scriven stated:

Since everything is evaluable to some extent in some contexts, the issue of evaluability is a matter of degree, resources, and circumstance, not of absolute possibility. Hence, while everything is evaluable, not everything is evaluable to a reasonable degree of confidence, with the available resources, in every context. (p. 18)

1.8. **Identify domain of expertise for the evaluation.** This checkpoint identifies the type of knowledge required to conduct the evaluation. E-learning evaluation requires knowledge in the area of technology. Sometimes the evaluator may have some knowledge in technology but not specific enough knowledge to find answers to some of the kind of questions to be answered. In this case, the evaluator needs to acquire more knowledge in the area or add an expert in the domain of expertise to the team.

1.9. **Determine if sample has to be used and how it will be selected.** The evaluator should decide, based on the information collected, if a group of end-users of an e-learning program should be used for the evaluation and how the group should be selected. The group selected may include people from different areas of the organization who are using the e-learning program. This includes learners, teachers, trainers, and instructional designers.

1.10. **Identify previous or existing cases that can be used for the evaluation.** Success cases can be used to identify major areas of improvement or changes. Previous e-learning programs can be used as a basis for the evaluation. Some cases could have been successful, and others could have failed. The purpose for using a success case is to determine the weaknesses and strengths of an e-learning program and identify better ways of making the innovation work (Brinkerhoff, 2003). Even though the Success Case Model
is not a comprehensive model, it aims at promptly pointing out areas of potential concerns of an innovation (Brinkerhoff, 2003).

1.11. Identify data collection and analytic procedures. This includes statistical methods to be used for the e-learning evaluation, cost analysis, expert consulting, and modeling. Also, the data collection method, such as observation, surveys, interviews, documentations, or focus groups, should be identified. In e-learning, observation is an important data collection procedure since it allows the evaluator to see how end-users interact with the system, and it quickly identifies areas where problems occurred. Quantitative as well as qualitative data can be collected.

Section 2: Foundations of the Evaluation

This section investigates the context and nature of the program to be evaluated. It also identifies the value and criteria of the e-learning program.

2.1. Background and context of the evaluation. E-learning settings and contextual factors determine what can contribute to the failure or success of the e-learning program. This also determines the classification of the object of the evaluation (i.e., policy, proposal, program, project, process, activity, product, outcome, or impact. The e-learning can fall in any of the mentioned classifications.

2.2. Description and definition of the object of the evaluation. The object of the evaluation should be fully described. The evaluator should record any official descriptions of the program, its components, context/environment, its clients, and the program logic. Based on the official description, the evaluator should develop a correct and complete description of the program, components, context/environment, and learning
outcome in detail. This detailed description can be different from the client’s version. In the case of e-learning, the meaning of each technical term should be fairly explained for a prospective audience not familiar with that terminology.

2.3. Determine who is impacted by the evaluation. Those are the direct recipients of the program and can be both students and staff. In e-learning, end-users are the impactees, as well as program staff, who can be individuals involved in the design and implementation of the e-learning program.

2.4. Identify current abilities, knowledge, and willingness of e-learning program participants. This checkpoint conducts an inventory of available resources. In the e-learning evaluation checklist, the assessment will determine resources such as employees’ technical skills and employees’ readiness and willingness to adopt e-learning. Organizational culture is an area of interest in the checklist. The culture of the organization is significant for organizations seeking to implement change such as the use of technology to deliver training or learning. As McNamara (2000) pointed out, organizational change frequently fails because the role of organizational culture is undermined by management.

2.5. Identify technological resources available for e-learning program. This checkpoint looks at organization capabilities and determines how the existing technology supports e-learning program. This will include available hardware, software, and network capabilities.

2.6. Identify possible constraints on the e-learning program. This should point out the lack of appropriate resources, such as technical problems, inadequate technology, and lack of qualified manpower to make the e-learning program functional. As mentioned
in checkpoint 2.4, organizational culture is also identified as one of the biggest restraints or determinants of e-learning success. Lack of management support in the implementation of e-learning can be a constraint on e-learning success.

2.7. *Identify e-learning criteria for the evaluation.* Six major criteria for e-learning evaluation have been identified through literature review:

1. **Design:** Involves the instructional strategies, content organization, media, and learner interactions.

2. **Usability:** Involves ease of use; navigation should be user-friendly and simple, allowing users to access learning modules. The quality of e-learning and user satisfaction are enhanced with good usability.

3. **Efficiency:** Involves time and cost saving. Learners should be able to accomplish more in less time.

4. **Accessibility:** Involves the fact that e-learning should be available for use anytime and anywhere. Accessibility also involves people with disabilities. Accessibility for learners with physical disabilities or hearing or vision impairments should be considered when addressing the accessibility criterion.

5. **Learning content:** Refers to learning objectives. Learning module contents should be aligned with learning objectives and organizational goals. Learning objectives should be clear and precise.

6. **Effectiveness:** Determines behavioral change on the job as a result of e-learning. E-learning effectiveness is also called the learning outcome or impact, which refers to learners’ knowledge and skills gained as a...
result of e-learning. Effectiveness of e-learning also looks at learners’ satisfaction.

2.8. *Assign a weight to each criterion and rank criteria by weight.* This process allows evaluators to determine the importance of each criterion. In the e-learning program, for instance, an evaluator may determine that the design of the e-learning program is more important than the efficiency of the program. Evaluators should use one of the six strategies laid out by Davidson (2005) to determine the importance of the criteria that will be used for the evaluation. Table 8 illustrates those strategies. Each one of those strategies has advantages and disadvantages. Both qualitative and quantitative methods should be used to determine priority of criteria.

Table 8

*Strategies to Determine Importance of Criteria*

<table>
<thead>
<tr>
<th>Strategy</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vote by stakeholders or consumers</td>
<td>Evaluator ask stakeholders to cast their vote on which criteria are important</td>
</tr>
<tr>
<td>Knowledge base of stakeholders</td>
<td>Gather information from selected stakeholders, and use it to determine criteria that are important</td>
</tr>
<tr>
<td>Literature review</td>
<td>Evaluator can use sources such as literature reviews, or evaluation of similar evaluands</td>
</tr>
<tr>
<td>Specialists’ judgment</td>
<td>Gather information from specialists who have worked extensively on similar evaluands</td>
</tr>
<tr>
<td>Needs and values assessments</td>
<td>Decisions is based on program’s needs and values assessments</td>
</tr>
<tr>
<td>Program theory/causal linkages</td>
<td>Evaluator decide on criteria based on program theory</td>
</tr>
</tbody>
</table>

Source: Davidson (2005)
2.9. *Identify the method for measuring each criterion.* Standards of measure are a kind of benchmark for the criterion. Standards of measure help identify "the levels of quality relevant for this evaluation" (Scriven, 2007b, p. 6). The criteria are assigned a grading scale for the evaluation. One of two methods can be used to measure the criteria. The organization can establish its own performance standards. Those standards will be used to measure each criterion. For instance, a higher education institution can have a standard of 3.00 grade point average for online courses that students take. The total average will be computed for all courses and measured against the 3.0 target that was set by the institution. Another method that evaluators should use if the organization does not have its own performance measure is the Benchmark for Internet-Based Courses developed by Phipps and Merisotas (2000). Phipps and Merisotas developed a list of 24 benchmarks that can be used to ensure the quality of the Internet-based course. Those benchmarks have been tested through six higher education institutions (Brevard Community College, Regents College, the University of Illinois at Urbana-Champaign, the University of Maryland University College, Utah State University, and Weber State University) that provide degrees online. The 24 benchmarks are grouped into seven categories: (1) Institutional Support Benchmarks, (2) Course Development Benchmarks, (3) Teaching/Learning Benchmarks, (4) Course Structure Benchmarks, (5) Student Support Benchmarks, (6) Faculty Support Benchmarks, and (7) Evaluation and Assessment Benchmarks.
Section 3: Learning, Outcomes, and Costs

This section focuses on the program activities of the learning (process), the impact (outcomes), and the cost.

3.1. Examine e-learning activities and procedures. In this checkpoint, evaluators need to take an in-depth look at how end-users interact with the program. This includes log-on process and accessing learning modules. Evaluators can do an observation as well as interviews, survey end-users, and refer to the program documentation.

3.2. Examine the general learning process. The learning process involves how end-users learn from the modules. Once they access the module, how does the learning occur? In e-learning, end-users will go through the module at their own pace; they can revisit the same module multiple times, and self-check their knowledge with test questions they can take at the end of each module.

3.3. Examine the logic of the e-learning program. This will determine the rationale for the e-learning program design. The logic for e-learning will include e-learning program design, plan, and theory, if necessary. In this checkpoint, evaluators identify what is to be learned and how it is presented.

3.4. Distinguish preprogram effects from program effects (see checkpoint 2.4). The preprogram effect is the reaction of end-users when a new program is to be implemented. In e-learning programs, there may be resistance to the idea of the new program being implemented. Are employees comfortable with the idea of new learning technologies? Will they embrace a new learning method? How do the users react after using the program?
3.5. *Identify rate of completion.* This checkpoint will identify the number of users that complete the course through e-learning. This is important, since a major drawback of e-learning is completion rate. Through documentation, the evaluator can have a record of those who did not complete the course. Surveys with open-ended questions and interviews can be used to identify the reasons for not completing the course online.

3.6. *Identify unintended consequences* (see checkpoint 2.2). Unintended consequences can be positive or negative. This determines if the e-learning program is working as expected. This can be determined through learners' experiences using open-ended survey, focus groups, and interview.

3.7. *Identify program costs.* Costs associated with the e-learning can be tangible and/or intangible. Tangible costs can be measured in terms of dollar amount and can be the cost of hardware, software, and labor. Intangible costs include system shutdown for malfunction and maintenance. Also, poorly designed e-learning programs that are time-consuming for learners to use are considered intangible costs. Resistance from employees as indicated in the literature (Rogers, 1995, 2003; Schein, 1992, 2004) is also identified as an e-learning intangible cost.

Section 4: Conclusion and Implications

This section is a combination of the findings in previous sections to form a conclusion for the evaluation. This is the final stage in the ELEC checklist, in which the evaluator draws a conclusion about the process and the object of the evaluation (Davidson, 2005). This conclusion is based on what has been described through the process of the evaluation.
4.1. *Create a performance profile for each criterion.* Using the criteria identified in checkpoint 2.7, the evaluator provides a profile for each criterion. The profile of each criterion will provide the ranking and value for each criterion for the e-learning program. The profile can be presented in graphical means, such as bar graph. The performance profile points out how well the e-learning program performs on each criterion relative to the performance matrix.

4.2. *Identify e-learning strengths, weaknesses, opportunities, and threats* (SWOT). SWOT is a business procedure used to identify areas of success and failure. In e-learning, conducting a SWOT analysis will specify areas that need improvement and require more attention, as well as areas that have performed well. The same analysis will also provide insight into opportunities that could be created through the e-learning program, as well as some threats to the program. In this section, the evaluator compares the findings to the client's goals, wants, and expectations and determines which of the goals were met and which were not. At the same time, the evaluator should also indicate what could have been done with the resources available for the e-learning program.

4.3. *Provide a written draft for the stakeholders' assessment.* This section will use information compiled in the preliminary phase to identify who should get copies of written report. The format for the report should have been specified in the information-gathering section. A written draft allows stakeholders to provide the evaluator with clarifications, objections, and/or comments before completion of the final report.

4.4. *Provide a final written report to stakeholders.* Once stakeholders provide feedback on the draft, the evaluator should edit the draft based on the feedback. Then, a final report is compiled and submitted to stakeholders.
4.5. *Present the final report to clients.* An oral presentation of the evaluation findings is recommended. This allows the evaluator to present his findings to clients and provide greater details to the clients if necessary. Visual tools such as graphs, charts, and tables should be used to facilitate interaction with the audience. Negative as well as positive findings should be reported. However, negative findings should be reported along with suggestions for improvement. Recommendations are expected in the report but should be limited to the organizational resources and capabilities.

4.6. *Provide follow-up if necessary and requested by stakeholders.* Follow-up activities are important as they allow the evaluator to address clients’ concerns and questions after report presentation. Clients may have more questions after the presentation, and the evaluator should have the opportunity to answer those questions. This checkpoint is strongly recommended and should be included in the written contract for the evaluation (Davidson, 2005). The follow-up will also ensure that the client is using the evaluation findings.

See Appendix A for the ELEC checklist and glossary.
CHAPTER IV

METHODOLOGY

Overview

The data collection protocol section presents the methodology and procedure used during the three-phase data collection process proposed for checklist validation. Three progressive data collection processes were used in the study. First, an expert panel review was conducted, followed by a pilot study of the checklist. The third data collection procedure included an administration of the survey evaluating the checklist. Figure 7 presents an overview of the model used in developing and testing the ELEC checklist.

![Figure 7. Model overview of data collection process.](image)

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Expert Panel Review

Overview

The expert panel is a group of domain experts who have the knowledge, expertise, and authority to subjectively assess the impact of specific processes and their performance measures. Expert panel review methodology is an expertise-oriented evaluation approach commonly used in evaluations (Worthen et al., 1997). According to Worthen et al., the expertise-oriented approach is one of the oldest and most widely used in evaluation. The expertise-oriented approach uses a variety of experts to examine specific needs related to structure, process, and outcome, and subsequently suggests an appropriate plan. There are four types of expertise-oriented approaches: (1) formal review system, (2) informal review system, (3) ad hoc panel review, and (4) ad hoc individual review (see Table 9 for characteristics of each type). This study used an ad hoc panel review, which is described as a non-institutionalized structure without preset standards. Instead, the ad hoc panel review process is characterized as a “one-shot” evaluation initiated by a particular study (Worthen et al., p. 126).

Purpose

The purpose of an expert panel review in the study was to provide critical feedback and review of the checklist. This was a formative assessment conducted during the development of the ELEC instrument (checklist). The expert panel was asked to evaluate the ELEC for usefulness and completeness.
Table 9

Characteristics of the Four Types of Expertise-Oriented Evaluation Approaches

<table>
<thead>
<tr>
<th>Type of Expertise-Oriented Evaluation Approach</th>
<th>Existing Structure</th>
<th>Published Standards</th>
<th>Specified Schedule</th>
<th>Opinion of Multiple Experts</th>
<th>Status Affected by Results</th>
</tr>
</thead>
<tbody>
<tr>
<td>Formal Review System</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Usually</td>
</tr>
<tr>
<td>Informal Review System</td>
<td>Yes</td>
<td>Rarely</td>
<td>Sometimes</td>
<td>Yes</td>
<td>Usually</td>
</tr>
<tr>
<td>Ad Hoc Panel Review</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>Yes</td>
<td>Sometimes</td>
</tr>
<tr>
<td>Ad Hoc Individual Review</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>Sometimes</td>
</tr>
</tbody>
</table>

Source: Worthen, Sanders, & Fitzpatrick (1997, p.120)

Experts provided critical comments on the relevance and validity of ELEC (Joppe, 2000; Messick, 1980, 1989, 1995; Winter, 2000). A set of questions guiding the expert panel was sent along with the checklist for the experts to address. The guiding questions entitled “survey feedback” can be found in Appendix C; the survey has a combination of closed-ended and open-ended questions. This allowed the expert panel members to make comments, suggestions, and/or criticisms.

Participants

Expert panel participants were selected for their expertise in computer-based e-learning, evaluation, and/or checklist design. A total of nine experts, including the three dissertation committee members, participated in the critical review of the ELEC.
Sampling Procedures

The expert panel members were selected using a purposive and convenience sample. Participants were selected based on their expertise in evaluation and e-learning, availability, and accessibility. Participants were selected from higher education and business.

Process

Six experts were invited to participate in the checklist review; all of them agreed to be panel members. Experts were contacted by phone, email, or through face-to-face meeting. Following the first contact, experts were sent an email inviting them to take part in the review of the checklist. The email specified the nature and purpose of the study and indicated how long it would take to complete the feedback survey (see Appendix C for expert panel invitation letter). The checklist and the survey questions were then sent, along with a letter of consent (see Appendix D for experts' feedback survey). There was no systematic scheduled data collection for the expert panel review. Experts were sent ELEC at different times. First, two experts were given the checklist for review. When feedback was received from both experts, follow-up interviews (one over the phone, and a face-to-face) were conducted regarding the feedback, and more clarification and suggestions were given on how to apply the changes. Upon revision of the checklist, the remaining four experts were sent the checklist for review. This two-step method used to conduct the expert panel review was beneficial, as it allowed for changes suggested by the previous two experts before sending the checklist to the other four. This provided an
iterative process, eliminating the need for getting the same feedback from all experts. Following the second revision, the three committee members were sent the checklist for review. Since the expert panel review is a formative process, the feedback received from the experts was used to alter the checklist, improve wording, make additions to or deletions from the checklist, and adjust the formatting to make the checklist professional.

Pilot Study

Overview

The second phase in this study was a pilot study. A pilot study is a small experiment that is held to test instrument and gather information prior to a larger study. A pilot study is used to develop and test the capability of research instruments (Baker, 1994). The aim of the pilot study is to improve the quality and efficiency of the instrument tested.

Purpose

The purpose of the pilot study was to use the revised ELEC and apply it to a smaller scale before it is used by a larger audience. The use of a small version allowed the instrument to be tested and revisions to be made as necessary.

Pilot Site

Open Learning Program (OLP) was used as the pilot. OLP is an asynchronous e-learning program. OLP is program from the Academic Technology and Instructional Services (ATIS) at Western Michigan University. During the pilot study, the revised
checklist was used to design an evaluation plan for OLP. The pilot study did not conduct an evaluation using the checklist.

**Process**

An email explaining the purpose and process of the pilot study was sent out to the director of OLP. Prior to the pilot study, the researchers met with both the OLP program coordinator and the interim director of ATIS. Two meetings were scheduled, on March 9, 2009 and March 11, 2009. During the meetings, information about the program was collected, and evaluation plan, process, and layout were discussed. The revised checklist was used in the pilot study to determine its applicability. Upon completion of the pilot study, the checklist was administered to a larger audience using an online survey.

**Survey**

**Overview**

Survey was the last method for data collection in this study. The ELEC checklist was further tested for effectiveness by asking members of six listserv (EVALTALK, ITFORUM, WEBTOLL, INSTTECH, ELEARNING-LIST, ILT-L) to review the checklist and complete the questionnaire online (see Appendix E for survey instrument). All six listserv are online listserv. Approximately 100 individuals were targeted and a response number was set at 40.
**Purpose**

The purpose of sending the ELEC and the questionnaire to a larger set of participants is to determine how the checklist is rated. An additional purpose is to determine how effectively participants can use the checklist.

**Process**

Two methods for identifying respondents were used. The first method used was snowball sampling (Bernard, 1999; Ho, 2005; Rea & Parker, 1997). Snowball sampling is used to find key persons and ask them to refer potential participants in the survey (Bernard, 1999; Ho, 2005). This method is used when there is difficulty locating population. Through snowballing, about 10 participants were located. Participants identified through snowballing were sent invitation emails. Upon receipt of the invitation emails, interested respondents sent an email agreeing to participate in the study. Following the response, a thank you message was sent along with the checklist and glossary. A second email was sent providing the link to the survey. In the second method, emails announcing the evaluation of the ELEC were posted to all selected listserv (see Appendix E for online survey invitation letter), and volunteers were asked to email the researcher if they were interested in completing the survey for the ELEC checklist. Once listserv members responded, they were sent an email with the checklist and glossary attached. A second email was sent with the link to the survey. At the end of the survey, respondents were given a choice to enter a contest drawing to win one of the five $50 VISA gift cards. The survey was posted on Survey Monkey at http://www.
There were two groups for survey links. The first group received individual survey links that were tied to their email address. This process was used to identify those who had not taken the survey in order to send them reminder emails. The second group was sent one survey link that all respondents could use to take the survey. This method did not allow the researcher to identify those who had not taken the survey; thus, a reminder was sent to everyone in the second group. Two reminders were sent. The first reminder was sent out a week following the posting of the survey, and the final reminder was sent a day before the survey was closed out. Responses were anonymous and confidential. Upon receipt of the evaluations from the survey, data collected were analyzed and reported. However, new changes were not made to the ELEC checklist but were reported in the results chapter as findings. Those were also used as suggestions for potential users of the ELEC.

Validity and Reliability of the Study

The validity and reliability of a study is a concern for any study as it is for this study. There are four types of validity: (1) construct validity, which determines how well the instrument is measuring the skills and knowledge it is intended to measure; (2) content validity, which determines how well the instrument represents the content that is measured; (3) predictive validity, which determines how well the test can predict future behavior of individuals; and (4) concurrent validity, which determines the relationship between two instruments that measure the same thing. Messick's (1995) framework for validity presents four components used to determine validity of an instrument (see Figure 8). There are two aspects of validity in Messick's framework: evidence and
consequences, which determine the source for the e-learning evaluation information and interpretation and use, which relate to the application and feedback of the checklist.

According to Joppe (2000), “Validity determines whether the research truly measures that which it was intended to measure or how truthful the research results are” (p. 1).

Campbell and Stanley (1966) discussed eight threats to the internal validity of a study, including history, maturation, pretesting, measuring instruments, statistical regression, mortality, differential selection of subjects, and selection-maturation interaction. Since this study did not use an experimental or control group, most of these threats were not a problem. However, there might be a history effect, as there could be some occurrence in the world at-large that might affect how people responded to the checklist and survey form.

![Figure 8. Messick's (1995) unified validity framework.](image-url)
The object of this study was to develop an appropriate checklist and have individuals review and evaluate the checklist for usability and suitability for what the checklist measures. Thus, many of the threats to internal validity were not a concern. However, it is not possible to randomly select or randomly assign individuals volunteering to evaluate the checklist. External validity addresses the generalizability of the findings of the study. Would similar findings be expected with a different set of evaluators (experts, pilot, and surveys)? The study has incorporated a number of steps (expert, pilot, and survey) to determine whether the ELEC is indeed measuring what it purports to measure, as well as including a variety of evaluators to assess the content of the checklist. In another situation, would the checklist be similar to the final content obtained in the process of testing? The checklist process sought to find a variety of situations in which individuals would use or assess the content of the checklist to ensure appropriate material was included. Scriven (2007b) and Stufflebeam (2000) argue checklist validity is based on the following criteria:

1. The checklist should be complete (i.e., no missing aspect of e-learning).
2. The checklist content should not be redundant.
3. The checkpoints in the checklist should be independent.
4. Criteria identified in the checklist should be of value to e-learning.
5. The checklist should be clear and concise.
6. The checklist should be useful to intended users.

Survey questions are based on those requirements to test the content validity of the checklist.
Limitations of the Study

As with any study, there are limitations that need to be spelled out regarding the methods and the generalizability of the findings of the analysis. The study has addressed the construction and validation of the ELEC as a form for evaluating e-learning or online computer-based learning system for an organization. The checklist developed as a part of the study does not include other facets of e-learning or online computer-based learning such as instructional design, content of learning, or online teaching. A limitation to the study is how honest and truthful the checklist evaluators are in their assessment of the content of the checklist. Another limitation to the study is the choice of members of the expert panel evaluating the checklist for usability and completeness. While every effort was made to select experts knowledgeable about e-learning and checklists, there is always a possibility the content of the checklist might be beyond their area of expertise. The same is true of the individuals completing the pilot study and the survey. The time individuals in the panel, pilot, and survey are willing to invest in reviewing and evaluating the checklist varies, and a limitation may be how thoroughly they are willing to evaluate the checklist and how much time they are willing to spend to do this.

Another limitation addresses the level of involvement and expertise of all the individuals participating in the evaluation of the checklist in e-learning or online computer-based learning, especially at the pre-implementation, implementation, and post-implementation phases. Their expertise might be more in delivery or development of content rather than implementation. An additional concern is whether the individuals volunteering to complete the evaluation of the checklist address all of the concerns
needing to be addressed, whether they may have possibly missed something in their evaluation and comments, or whether their comments may be biased in some way. Ensuring there are a number of different participants with different viewpoints is essential. Participants were also not randomly selected or assigned, but were volunteers. Volunteers may be intrinsically different from non-volunteers and might be biased in their perceptions of checklists or e-learning.

Here are a few additional limitations that became apparent after the data collection was complete.

A major limitation of the research was the testing of the ELEC checklist through the pilot study. The Open Learning Program used for the pilot study is a new program that began in January of 2009. The instrument (ELEC checklist) could not be fully implemented for that reason. Only two sections (section 1—Preliminary and Information Gathering, and section 2—Foundations of the Evaluation) were used for the pilot study. An evaluation was not conducted during the pilot study; instead, an evaluation plan was developed and proposed as a first step toward the full implementation of the ELEC checklist as an evaluation tool.

A second limitation of the study was the selection of expert panel members. Expert panel members were selected based on their availability and qualifications. Even though a great deal of effort was put into having a diverse group, none of the expert panel members was affiliated with a non-profit organization. The ELEC checklist was designed to be used in all type of organizations; therefore, the sample for expert panel members was not representative of all organizations. Also, the number of expert panel members (\(N = 7, 77\%\)) affiliated with higher education was much greater than those who worked in
different type of organizations. This can have an impact on the generalizability of the ELEC checklist on all types of organizations.

The third limitation of the research was the snowballing sampling used in the survey. The use of the snowball in this study could affect the generalizability of the research. However, the number of participants selected through snowballing was small compared to the total number of respondents. The limited size of snowball participants could help overcome this limitation.
CHAPTER V

FINDINGS

Overview

The purpose of this chapter is to analyze the data and report the findings from the three sequential phases of the research. In January 2009, an expert panel was used to help develop and solidify the checklist. In February 2009, the checklist was applied by the author, who used the tool to develop an evaluation plan for a local e-learning program. Finally, in April 2009, an online survey was used to collect data from 76 persons who were familiar with e-learning programs and/or evaluation. It is important to note that revisions—and improvements—were made to the checklist throughout the data collection process.

Expert Panel Review Findings

Expert Panel Members

A total of nine expert panel members, including the three committee members, participated in the critical review of the ELEC checklist. The nine members include two independent evaluators, two senior executives in e-learning, two instructional designers, and three university professors. Four experts identified themselves as e-learning professionals, and the other five as evaluators. However, two experts identified
themselves as both evaluators and e-learning professionals. Reviewers responded to close-ended questions as well as open-ended questions.

**Closed-ended Questions Feedback**

Eleven closed-ended questions (see Appendix C for expert panel feedback questionnaires) were answered by the experts about the quality of the checklist. The highest rating by all experts was found with criteria for the evaluation not overlapping. The second highest rated was the applicability of the checklist to different types of organizations. This was followed by both usefulness and conciseness criteria. Next, coherence of the checklist and completeness of the criteria were equally rated. Ease of use and completeness of checklist were rated second lowest. Among all the lowest rated were "checklist meeting the need of an evaluation" and "clarity of checklist wording." One question, "Criteria can be measured by common standard," was omitted by all evaluators; therefore, no rating was applied. Table 10 shows the ranking.

**Qualitative Feedback Open-ended Questions**

The following three open-ended questions were included in the critical feedback survey:

1. What are the strengths of the checklist?
2. What are the weaknesses of the checklist?
3. What topics or areas do you believe need further clarification?

Strengths of the checklist were grouped in two major categories: (1) content, and (2) completeness. The content refers to the type of information provided in the checklist and
the range of information as well. Experts agreed that a considerable amount of information was provided in the checklist.

Table 10

*ELEC Checklist Expert Panel Criteria Ranking*

<table>
<thead>
<tr>
<th>Questions Ranking</th>
<th>Scale</th>
</tr>
</thead>
<tbody>
<tr>
<td>Criteria of merit not overlapping</td>
<td>4.5</td>
</tr>
<tr>
<td>Checklist will be applicable to different types of organizations</td>
<td>4.2</td>
</tr>
<tr>
<td>The checklist provides useful information</td>
<td>4</td>
</tr>
<tr>
<td>Criteria of merit are concise</td>
<td></td>
</tr>
<tr>
<td>The checklist is coherent</td>
<td>3.8</td>
</tr>
<tr>
<td>Criteria of merit are complete</td>
<td></td>
</tr>
<tr>
<td>Checklist is complete</td>
<td>3.5</td>
</tr>
<tr>
<td>Checklist is easy to use</td>
<td></td>
</tr>
<tr>
<td>Checklist wording is clear</td>
<td>3.3</td>
</tr>
<tr>
<td>Checklist meets the needs of an evaluation</td>
<td>3</td>
</tr>
</tbody>
</table>

Rating: 5 = highest, 1 = lowest

Two major weaknesses were identified: (1) clarity, and (2) ease of use of the checklist. Experts mentioned that language may not be understandable by non-evaluators. This will make the checklist hard to understand. As it turned out, all expert panel members recommended that the ELEC checklist should use less jargon and also provide guidance on how to use the instrument.
Changes Made to ELEC Checklist Following Expert Panel Review

Based on expert panel members' feedback, a number of changes were made to the ELEC checklist to improve the quality of the instrument. A structural change was made to the ELEC checklist, a new column listing the source of data was created, and further instructions on how to use the checklist were added to the introduction page. The amount of detail, including references in each checkpoint, was tremendously reduced to address the issue of the ELEC checklist length. Some of the information removed from the checklist was inserted in the glossary that is to be used with the ELEC checklist. One checkpoint—1.2, “Clarify the purpose and intended users of the evaluation”—was added to section 1. Experts mentioned that there should be a difference between clients, audience, and intended users in the checklist. Through additional literature review, the evaluator decided to include intended users as another checkpoint in the checklist. In section 3, two checkpoints—3.5, titled “Identify monetary and no-monetary cost,” and 3.6, titled “Identify direct and indirect costs”—were merged into one checkpoint, 3.7, titled “Identify program costs.” Both checkpoints were similar, so it sounded redundant to have both checkpoints and that could have created confusion for the evaluator. Also, in section 3, the heading “Sub-evaluation” was changed to “Learning, Outcomes, and Costs.” The format of the ELEC checklist was also changed from portrait to landscape to allow a better readability of all columns in the checklist. The number of pages went from 9 to 5 pages. Also, the language used in the checklist was revised and edited. Most of the terminology specific to evaluation, such as “evaluand, impactee, ascriptive evaluation,”
was removed from the checklist and replaced with common words such as “object of the evaluation” or “people impacted by the program.”

Open Learning Program Pilot Study Findings

The first two sections of the ELEC checklist were applied during the pilot study: (1) Preliminary and Information Gathering, and (2) Foundation of the Evaluation. Since the pilot study was used to design an evaluation plan, the last two sections could not be implemented.

Preliminary and Information Gathering Findings

Meetings with OLP Representatives

The meetings were taped with the representatives’ authorization. Few problems were encountered during the preliminary and information gathering phase (see section 1 of the ELEC checklist) for the pilot study. There were two different perspectives that emerged through the meeting: the evaluator’s perspective, and the client’s (representatives) perspective. The representatives were not familiar with the evaluation terminology used in the ELEC checklist and the meetings. As a result, some of the answers to the questions posed by the evaluator were not satisfactory and the evaluator had to rephrase those questions. Since both representatives could not agree on answers for specific questions, the evaluator had to ask them to provide information about the program and that generates more answers than the structured interview. It was easier for the respondents to tell the evaluator what the program was all about and what was
expected from the program as well. The transcript for the meetings was reviewed, and some discrepancies appeared between the notes that were taken during the meetings with the client and the transcript; the notes and transcripts were reconciled using the documentation provided.

*Documentation Review*

The evaluator was able to obtain a copy of the proposal, the budget chart, and the flyers for the Open Learning Program. The proposal laid out the description, nature, and objectives of the Open Learning Program. The proposal review was the most informative, as it helped the evaluator identify information that was still missing after the two meetings with program representatives. Some of the documentation needed for the evaluation planning was not available, either because the program was still new or the information was under the university’s or ATIS’s program descriptions. The Web site for the program (www.atis.wmich.edu/openlearning) was another source for documentation. The evaluator was also referred to both the university and ATIS Web page (www.wmich.edu; www.atis.wmich.edu) for complementary information. Also, information gathered through WMU, ATIS, and OLP Web sites were very useful as well.

Information gathered in section 1, preliminary and information gathering, helped the evaluator accomplish the tasks necessary for that section. The point of contact, audience, stakeholders, and intended users of the evaluation were all identified.

It was determined through the meetings and document review that the evaluation would be a formative evaluation since the program was at a developmental stage and findings of the evaluation would help improve and strengthen the program.
This evaluation helped determine if the program was meeting its goals and objectives. Since the nature of this evaluation was to determine the merit of the program, greater emphasis was put on the quality of the program, which focuses on success or failure of the program. The program was so new that the timeframe was at the beginning of the program, which is a short-term period. The feasibility assessment was limited to the goals of the Open Learning Program. Budget and time were not included in the evaluative feasibility, since the evaluator was not getting paid to conduct the evaluation plan. Through the meetings, the evaluator and the representatives agreed that sample to be used should include students, teachers, instructional designers, program director and coordinator, and staff. This sample was representative of everyone involved in the program. There was not an existing success case that could have been used in the organization, so the evaluator relied on the literature review of previous e-learning evaluations or e-learning programs for a success case model. The data collection instruments were interviews (face-to-face, online, email), surveys, and pre- and posttests. The evaluator had the knowledge, qualification, and credentials (technology and evaluation) required to conduct the evaluation.

Foundations of the Evaluation Findings

Using the document review and the interview transcript from section 1, the evaluator was able to accomplish the tasks necessary for the evaluation plan as specified in section 2.

The object of the evaluation was identified as a program; the descriptions and definitions of the program were found in the proposal and on the Web page of the OLP.
The recipients of the program were identified as the students, and everyone involved in the program including students, instructional designers, staff, and faculty would be impacted by the outcome of the program. The current abilities, knowledge and willingness of participants could not have been determined through this process, but surveys and interviews were used to address that during the evaluation. The technological resource available to access the program was Blackboard. Some potential constraints discussed with program representatives were the unavailability of Blackboard to students who may not have the system requirements to access the learning courses, and the number of courses offered through the program. The criteria for the evaluation were discussed using the six criteria listed in the checklist: (1) design, (2) usability, (3) efficiency, (4) accessibility, (5) content, and (6) effectiveness. The client decided that usability, efficiency, accessibility, and effectiveness were the criteria to be used for the evaluation.

Criteria Ranking by Stakeholders

A vote by stakeholders was the method used to rank the criteria. A ranking form was sent to the program coordinator, ATIS director, and an instructional designer. The form included indicators for each criterion and a ranking scale from 1–5, with 1 being the lowest and 5 the highest, and a comment space for each criterion (see Appendix G for criteria ranking form). Once all three voters assigned a weight to each criterion, the total for each criterion was computed. The average for each criterion was used to rank the criteria. The criterion with the highest score (most important) was accessibility, followed by effectiveness, efficiency, and usability (see Table 11 for criteria ranking).
Table 11

*Criteria Ranking by Stakeholders’ Vote*

<table>
<thead>
<tr>
<th>Criterion</th>
<th>Rank</th>
</tr>
</thead>
<tbody>
<tr>
<td>Accessibility</td>
<td>5</td>
</tr>
<tr>
<td>Effectiveness</td>
<td>4.8</td>
</tr>
<tr>
<td>Efficiency</td>
<td>4.5</td>
</tr>
<tr>
<td>Usability</td>
<td>4</td>
</tr>
</tbody>
</table>

*Criteria Measurement Methods*

Criteria were measured qualitatively and quantitatively through two methods. The first method used standards established by the Open Learning Program (OLP). Target sets by the program were provided to the evaluator to be measured against the outcome of the program. The effectiveness criteria were measured using program standards, since this criteria include student credit hours, enrollment rate, and completion rate. For instance, if the program had a target for number of students who should register per semester, this target was used to draw a comparison with the actual number of students who registered each semester.

The second method that was used to measure the criteria is the Benchmarks for Success in Internet-Based Distance Education prepared by The Institute for Higher Education Policy for the National Education Association (NEA, 2000). This document provides benchmarks that can be used to measure the quality of online education. This document provides a list of 24 benchmarks that are critical for e-learning success. Those criteria are grouped in seven major categories: (1) Institutional Support Benchmark,
(2) Courses Development Benchmarks, (3) Teaching/Learning Benchmarks, (4) Course Structure Benchmark, (5) Student Support Benchmarks, (6) Faculty Support Benchmarks, and (7) Evaluation and Assessment Benchmarks. These benchmarks have been tested through six higher education institutions (Brevard Community College, Regents College, the University of Illinois at Urbana-Champaign, the University of Maryland University College, Utah State University, and Weber State University) that provide degrees online. This method was chosen for two reasons: first, because the benchmarks have been tested, and second, because the evaluation was conducted in a higher education environment and the testing was also done in institutions of higher education. The usability and accessibility criteria were measured using these benchmarks since those criteria involved the technology used for the program. (See Table 12 for Criteria Measurement Methods.)

Table 12

Method Used for Criterion Measurement Based on OLP Standards and NEA Benchmarks

<table>
<thead>
<tr>
<th>Criterion</th>
<th>Method</th>
<th>Instrument</th>
<th>Data Sources</th>
</tr>
</thead>
<tbody>
<tr>
<td>Accessibility</td>
<td>Benchmarks</td>
<td>Survey, interview</td>
<td>Students, faculty</td>
</tr>
<tr>
<td>Effectiveness</td>
<td>Standards</td>
<td>Record Review, interview</td>
<td>Documentation, OLP coordinator</td>
</tr>
<tr>
<td>Efficiency</td>
<td>Standards</td>
<td>Record review, interview</td>
<td>Documentation, students, coordinator</td>
</tr>
<tr>
<td>Usability</td>
<td>Benchmarks</td>
<td>Survey, interview</td>
<td>Students, faculty, IT staff</td>
</tr>
</tbody>
</table>
Observations from the Pilot Study

After completion of the pilot study, the ELEC checklist was slightly changed. It was apparent that the terminology was a problem for the persons of contact. Even though some evaluation terminologies were changed after the expert panel review, a few words needed to be changed again. One main observation was that clients (representatives) had limited information about the process of evaluation. Therefore, it was more difficult to clarify the role of the evaluator (see checkpoint 1.5). A better approach would have been to send the checklist and glossary to the representatives of the organization prior to the initial interviews with them. This would have given them more time to go through the checklist, and perhaps they could have received answers to any questions they had prior to our first meeting to discuss the checklist. Another observation is that the stakeholders who participated in the criteria voting process should communicate with the evaluator regarding the criteria and the process. In the Open Learning Program pilot study, one of the voters had no previous contact with the evaluator and had difficulty understanding what each criterion meant specifically and how it was selected in the first place. It took the respondent much more time to complete the ranking form than the other voters who were at the meeting.

Survey Findings

In this phase, an online survey using Survey Monkey (www.surveymonkey.com) was administered to members of six listserv (EVALTALK, ITFORUM, WEBTOLL, INSTTECH, ELEARNING-LIST, ILT-L). A total of $N = 76$ respondents participated in
the ELEC survey to evaluate the e-learning checklist. Respondents included males ($N = 19, 25.3\%$) and females ($N = 56, 74.7\%$) and ranged in age from 25 to 69 with respondents spread across the age groups: $25–39 (N = 24, 31.6\%), 40–54 (N = 33, 43.4\%), 55–69 (N = 17, 22.4\%)$. See Figure 9 for gender of respondents. Survey respondents had completed a bachelor's degree ($N = 6, 7.9\%$), a master's degree ($N = 39, 51.3\%$), or a doctoral degree ($N = 30, 39.5\%$). See Figure 10 for educational level of respondents. The study group was composed of e-learning professionals ($N = 41, 54\%$), evaluators ($N = 11, 14.5\%$), both e-learning and evaluation professionals ($N = 16, 21\%$), and other disciplines that included people who had conducted or participated in an online course or training ($N = 8, 10.5\%$). See Figure 11 for profession of respondents.

When asked whether they had participated in online training or courses, a number of respondents ($N = 35, 46\%$) indicated they had all of the time. Respondents were also

![Figure 9. Gender of respondents.](image-url)
Figure 10. Educational level of respondents.

Figure 11. Expertise of respondents.
asked whether they had developed online training or education, and \( N = 32 \) (42.1%) of the respondents indicated they had. When asked whether they work with online training or education, the majority of the respondents \( (N = 41, 54\%) \) responded they do all the time. A few of the respondents \( (N = 4, 5.3\%) \) had never participated in an online training or education, \( N = 18 \) (23.7%) had participated occasionally in an online course or training, \( N = 19 \) (25%) participated frequently in an online training or education, and \( N = 35 \) (46%) participated all the time in online training or education. See Table 13 for respondents' level of involvement with online education.

**Table 13**

_Respondents Level of Involvement with Online Education or Training_

<table>
<thead>
<tr>
<th></th>
<th>Never</th>
<th>Occasionally</th>
<th>Frequently</th>
<th>All of the time</th>
</tr>
</thead>
<tbody>
<tr>
<td>( N )</td>
<td>4</td>
<td>18</td>
<td>19</td>
<td>35</td>
</tr>
<tr>
<td>( % )</td>
<td>5.26</td>
<td>23.68</td>
<td>25</td>
<td>46.05</td>
</tr>
<tr>
<td>Participate in online</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Develop online</td>
<td>11</td>
<td>14</td>
<td>19</td>
<td>32</td>
</tr>
<tr>
<td>Work with online</td>
<td>7</td>
<td>11</td>
<td>17</td>
<td>41</td>
</tr>
</tbody>
</table>

The ELEC consisted of 18 items addressing ease of use and content of the checklist. The ease of use group consisted of 9 items and the content of the criteria contained 9 items. A Cronbach alpha was calculated for the total ELEC scaled items and was found to be \( \alpha = .992 \), indicating the total ELEC scale had very high internal consistency and reliability. The Cronbach alpha for the ease of use items was \( \alpha = .988 \) and the alpha for the content items was \( \alpha = .992 \). Overall, the ELEC scaled items demonstrated a high level of internal consistency and reliability. The means were
calculated for each item and rank ordered for different groups. When the items were rank ordered by the means, the usefulness of the checklist was rated the highest by all of the participants, followed by planning, different organizations, and ease of understanding. The item means ranged from 4.22 to 3.20, and the lowest average ranked items were cost associated with e-learning evaluation, method for e-learning criteria ranking, criteria for evaluation are not overlapping, and checklist is useful for determining appropriate data collection method. Table 14 presents the rank ordered means for all ELEC items for all of the survey participants.

**ELEC Findings by Expertise**

The items in the ELEC evaluation survey were then rank ordered by the means for respondents by expertise. Respondents indicated their expertise was e-learning \( (N = 41) \), evaluation \( (N = 11) \), both e-learning and evaluation \( (N = 16) \), or other \( (N = 8) \). Means were calculated for each group for each item and rank ordered. The four expertise groups indicated they had different opinions of the ELEC. However, three of the groups found the checklist useful as their highest ranked item, while two groups thought planning was the second highest rated item, along with two groups feeling usefulness was the second rated item on the checklist. A \( t \) test was used to compare e-learning and evaluation professionals. A \( t \) test compares the means of two groups and was appropriate as “both” and “other” were dropped from the analysis and a probability level for determining whether there were statistically significant differences was \( p = .05 \). The items were also compared along with the total scale score and scores for ease of use and content. The \( t \) test analysis found there were no statistically significant differences in perceptions for
Table 14

*Rank Ordered Means for All Respondents*

<table>
<thead>
<tr>
<th>Item Number</th>
<th>Item Name</th>
<th>N</th>
<th>Mean</th>
<th>Std Dev</th>
</tr>
</thead>
<tbody>
<tr>
<td>4</td>
<td>Provides useful information</td>
<td>61</td>
<td>4.22</td>
<td>.824</td>
</tr>
<tr>
<td>13</td>
<td>Is useful for planning e-learning evaluation</td>
<td>61</td>
<td>4.08</td>
<td>.918</td>
</tr>
<tr>
<td>5</td>
<td>Is applicable to different types of organizations</td>
<td>63</td>
<td>4.06</td>
<td>.800</td>
</tr>
<tr>
<td>2</td>
<td>Is easy to understand</td>
<td>64</td>
<td>4.01</td>
<td>.826</td>
</tr>
<tr>
<td>8</td>
<td>Wording is clear</td>
<td>63</td>
<td>3.96</td>
<td>.915</td>
</tr>
<tr>
<td>7</td>
<td>Is useful for identifying information sources for e-learning evaluation</td>
<td>62</td>
<td>3.93</td>
<td>.765</td>
</tr>
<tr>
<td>18</td>
<td>Is overall a good framework for e-learning evaluation</td>
<td>61</td>
<td>3.88</td>
<td>.984</td>
</tr>
<tr>
<td>6</td>
<td>Provides clear directions for evaluating e-learning</td>
<td>63</td>
<td>3.82</td>
<td>1.07</td>
</tr>
<tr>
<td>12</td>
<td>Helps identify the needs of the client</td>
<td>59</td>
<td>3.77</td>
<td>.983</td>
</tr>
<tr>
<td>1</td>
<td>Is complete</td>
<td>63</td>
<td>3.73</td>
<td>1.06</td>
</tr>
<tr>
<td>17</td>
<td>Is a tool that respondents are willing to use to conduct e-learning evaluation</td>
<td>62</td>
<td>3.66</td>
<td>1.11</td>
</tr>
<tr>
<td>11</td>
<td>Is concise</td>
<td>62</td>
<td>3.64</td>
<td>.907</td>
</tr>
<tr>
<td>9</td>
<td>Criteria for evaluating e-learning are complete</td>
<td>64</td>
<td>3.54</td>
<td>1.12</td>
</tr>
<tr>
<td>3</td>
<td>Is easy to use</td>
<td>63</td>
<td>3.50</td>
<td>1.02</td>
</tr>
<tr>
<td>14</td>
<td>Is useful for determining appropriate e-learning data collection method</td>
<td>61</td>
<td>3.49</td>
<td>1.08</td>
</tr>
<tr>
<td>10</td>
<td>Criteria for evaluating e-learning do not overlap</td>
<td>61</td>
<td>3.37</td>
<td>.985</td>
</tr>
<tr>
<td>16</td>
<td>Is useful in selecting appropriate methods for e-learning criteria ranking</td>
<td>61</td>
<td>3.22</td>
<td>1.07</td>
</tr>
<tr>
<td>15</td>
<td>Is useful for identifying costs associated with e-learning evaluation</td>
<td>62</td>
<td>3.20</td>
<td>1.05</td>
</tr>
</tbody>
</table>
evaluators and e-learning professionals. Table B1 (see Appendix B) presents ELEC’s item means in rank order for each of the four groups, and Table B2 (see Appendix B) presents the results of the $t$ test analysis for evaluators and e-learning professionals.

Qualitative Feedback from Survey

The survey concluded with two open-ended questions: (1) What are the strengths of the ELEC checklist? and (2) What are the weaknesses of the ELEC checklist? With a sample size of $N = 76$ respondents, there were $N = 57$ (75%) who gave feedback on the strengths of the ELEC checklist, and $N = 54$ (71%) who commented on the weaknesses of the ELEC checklist. All the responses to the open-ended questions were recorded, analyzed, and grouped into categories similar to the key variables specified in the quantitative analysis. See Table 15 for strengths and weaknesses reported by respondents.

Strengths of ELEC Checklist Reported by Respondents

Six major themes emerged from the responses on the ELEC checklist strengths: (1) completeness, (2) structure, (3) ease of use, (4) clarity, (5) conciseness, and (6) brevity. The number one strength of the ELEC checklist identified by the respondents was completeness. An overwhelming number (37%) of the respondents reported that the ELEC checklist is comprehensive and covers all major areas necessary to conduct an e-learning evaluation. This was followed by structure (13%), ease of use (12%), clarity (11%), conciseness (10%), and brevity (7%). See Figure 12 for strengths of the ELEC checklist.
Table 15

Rank-Ordered Strengths and Weaknesses Reported by Respondents

<table>
<thead>
<tr>
<th>Strengths of the ELEC Checklist</th>
<th>Weaknesses of the ELEC Checklist</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Completeness</td>
<td>1. Length</td>
</tr>
<tr>
<td>• “The comprehensiveness of the checklist was its major strength.”</td>
<td>• “I think the checklist is too comprehensive.”</td>
</tr>
<tr>
<td>• “The checklist compiles everything that is needed into one document.”</td>
<td>• “As with any checklist, it is somewhat cumbersome.”</td>
</tr>
<tr>
<td>• “The checklist is comprehensive and does allow for extensive evaluation of organizational needs.”</td>
<td>• “It seems quite overwhelming at first and you have to sort through quite a bit.”</td>
</tr>
<tr>
<td>2. Structure</td>
<td>2. Structure</td>
</tr>
<tr>
<td>• “The checklist is a structured guide and tool with useful prompts.”</td>
<td>• “Some steps could be broken down further.”</td>
</tr>
<tr>
<td>• “The checklist is well organized.”</td>
<td>• “Could reformat to look better.”</td>
</tr>
<tr>
<td>• “The checklist follows a systematic order of instructional design.”</td>
<td>• “Use bullet and reduce margin so tables are even more readable.”</td>
</tr>
<tr>
<td>3. Ease of use</td>
<td>3. Broadness</td>
</tr>
<tr>
<td>• “The checklist is easy to understand and follow.”</td>
<td>• “The checklist is too generalized.”</td>
</tr>
<tr>
<td>• “The checklist is clean and use simple format in which the text is easily understood.”</td>
<td>• “The checklist needs to be more detailed.”</td>
</tr>
<tr>
<td>• “The checklist lists elements sequentially which makes it easy to use and understand.”</td>
<td>• “The tasks are too general for appropriate course-level evaluation.”</td>
</tr>
<tr>
<td>4. Clarity</td>
<td>4. Data sources</td>
</tr>
<tr>
<td>• “The checklist is designed with clear parameters.”</td>
<td>• “Examples would be great for the data sources.”</td>
</tr>
<tr>
<td>• “The introduction page clearly explains the purpose of the document.”</td>
<td>• “Needs more specific examples of data sources.”</td>
</tr>
<tr>
<td>• “The strength is that the checklist is clearly divided into four parts that clearly link the different aspect of an evaluation.”</td>
<td>• “I think some of the data source descriptions could be more detailed.”</td>
</tr>
<tr>
<td>5. Conciseness</td>
<td></td>
</tr>
<tr>
<td>• “The checklist is reasonably concise.”</td>
<td></td>
</tr>
<tr>
<td>• “Everything is laid out into one concise document.”</td>
<td></td>
</tr>
<tr>
<td>• “The checklist is short and concise.”</td>
<td></td>
</tr>
<tr>
<td>6. Brevity</td>
<td></td>
</tr>
<tr>
<td>• “The checklist is short and easy to follow.”</td>
<td></td>
</tr>
<tr>
<td>• “The checklist is comprehensive but not too long.”</td>
<td></td>
</tr>
<tr>
<td>• “The checklist is short, concise, and clear.”</td>
<td></td>
</tr>
</tbody>
</table>
Figure 12. Strengths of the ELEC checklist by respondents.

Weaknesses of ELEC Checklist Reported by Respondents

The perceived weaknesses of the ELEC checklist enumerated by the respondents were grouped in four categories: (1) length, (2) structure, (3) broadness, and (4) data sources. The length (26.5%) and the structure (26.5%) of the checklist were the highest ranked by the respondents. These were followed by the broadness of the checklist (24.5%), and the data sources (22.5%). See Figure 13 for weaknesses of the ELEC checklist.

Suggestions from Respondents

A few suggestions were made by the respondents in order to improve the checklist or overcome some of the weaknesses listed. One suggestion that was made regarding data
sources was to use a qualitative case study as methodology to test the checklist; then use that case study to provide examples for data sources in the final version of the checklist. The other suggestion made was related to questions that were posed to clients in order to conduct the evaluation. The respondent commented that clients are experts; therefore, “why” questions need to be asked, rather than “what” questions. The same respondent suggested that the evaluator should say to a client in checkpoint 1.2, “Just tell us what you want to accomplish and we will help you figure what questions will help you do that.” Other suggestions were to use a flowchart or decision tree along with the checklist to guide the evaluator through the process. One respondent suggested including K-12 e-learning in the checklist since it is a growing area for e-learning. The same respondent
also suggested including the international programs and cultural aspects of e-learning in
the checklist.

*Changes Made to ELEC Checklist Following Survey Findings*

Based on the findings from the survey, minor changes were made to the ELEC checklist. No new element was added to the framework. However, some of the information removed from the checklist and put in the glossary was incorporated back into the ELEC checklist. This was done to address some of the concerns that were brought up in the open-ended questions. The criteria for e-learning evaluation were added from the glossary. The methods for criterion selection and testing were also put back in the checklist.

*Summary of the Findings*

The findings from all three phases of data collection used in the study yielded constructive ideas for improving the checklist. Informants were generally very positive about the instrument and the purpose it serves. The expert panel review provided useful feedback that was used to improve the ELEC checklist. The pilot study, which only used part of the ELEC checklist in the development of an evaluation plan, also yielded insights and ideas that help further refine the checklist. Finally, the online survey, which comprised the third phase of the research, generated positive, good responses overall. Respondents of the survey rated usefulness of the checklist the highest, followed by planning. In addition, the ELEC scale had high consistency and reliability scores.
While Chapter V has provided a broad review of the findings from the three phases of data collection, Chapter VI includes a discussion of these findings and the implications for future research.
CHAPTER VI

DISCUSSION AND CONCLUSION

At the beginning of the previous chapter, it was noted that revisions to the checklist were made throughout the data collection process; more substantial changes were made at the conclusion of each phase of data collection when the results could be analyzed and conclusions drawn. This final chapter builds on the findings and analysis of previous chapters by discussing the results and possibilities for future research. The chapter discusses the implication for the framework that was developed as well as implications or suggestions for future research.

Research Objective

This study proposed a new framework for the evaluation of e-learning programs. The main goal of the study was to design a framework for e-learning evaluation that could be applied in diverse organizations (i.e., higher education, business, and non-profit organizations) regardless of their type, size, and structure. This implies that the framework will be broad in nature. The framework sought to be comprehensive with the intention that organizations could tailor it to their specific needs. The framework was set up to provide guidance to evaluators and e-learning professionals wishing to conduct their own evaluation. The ELEC checklist can serve as a set of prompts or reminders for professional evaluators; it can serve as a more structured process guide for less
experienced non-evaluators; it can also provide ideas about what might be useful, for example, when negotiating or planning for an e-learning evaluation. The tool could be used by professional evaluators as well as those who are not specialized in evaluation but wish to conduct an evaluation of their e-learning program. The rationale for developing such a tool was that the literature indicated that there is a lack of satisfactory models for e-learning evaluation as well as a need for a comprehensive evaluation model for e-learning. Also, the literature review helped identified factors necessary to conduct an e-learning evaluation; those factors were incorporated in the ELEC checklist. The ELEC checklist was designed based on the Key Evaluation Checklist (KEC), a tool created by Scriven (2007a). One of the main contributions of this research is to demonstrate the importance of the use of checklists when conducting an evaluation of e-learning programs. Even though checklists are considered basic research tools, the flexibility that they provide and their mnemonic nature is of great value to evaluators. The ELEC checklist will add to the body of existing evaluation models geared toward e-learning assessment. However, the true contribution of this research lies in the generalizability of the framework. ELEC checklist provides guidance and step-by-step instruction that can be used in the process of evaluation. The different stages for the e-learning evaluation suggested in the checklist can be applied to all organizations. The checklist can be used as well for an evaluation process reengineering within any organization. Organizations that have existing e-learning evaluation tools can redesign or improve their tools using the ELEC framework.
Impact of ELEC Checklist on Evaluation Professionals

Even though the ELEC checklist builds upon the Key Evaluation Checklist (KEC), which is well known by evaluators, the framework has elements specific to e-learning that differentiate both frameworks. An evaluator not familiar with the technical aspect of e-learning will find great value in the ELEC checklist when conducting an e-learning evaluation. The iterative process of collecting data and incorporating revisions across three phases of data collection yielded a sound checklist or framework to guide and help improve the evaluation of e-learning programs.

During the checklist development process, nearly a dozen versions of the checklist evolved. The feedback from reviewers was mixed and differed depending on the professional background of the informants and other important background variables. In the end, the survey findings showed that relatively strong consensus was reached among informants when it comes to the usefulness and completeness of the checklist.

The analysis of variance that was conducted to differentiate among the groups did not show a significant statistical difference among the groups, in that three major group comparisons were conducted:

1. **Expertise**: In this group, professional evaluators were compared to the e-learning professionals group.

2. **Age**: The four age groups were compared to see if there was a difference based on experience.

3. **Education**: The level of education was also used to identify differences among the four groups.
Those findings reveal that the checklist was equally rated regardless of expertise, age/experience, or education level. This shows that there is a middle ground in potential users of the ELEC checklist. Since the main purpose for designing the ELEC checklist was to develop a framework that can be used across the aisle, those findings confirm that the ELEC checklist met its goals. Another way to explain the findings between the two professional groups is that evaluators have been gaining a better understanding of the field of e-learning as it becomes more and more popular. At the same time, e-learning professionals also are becoming more familiar with evaluation as this grows in importance for this field.

However, there is some difference of opinions on some elements of the checklist. For example, while some respondents find it complete, others find it too broad, but this is minor compared to what the respondents agree upon.

It is also important to note that the ELEC checklist cannot be considered final or fixed. Like any checklist, revisions are ongoing process, and the ELEC checklist is expected to go through numerous changes. The expectation is that practitioners who use this instrument will adapt and modify it further to meet their specific needs.

One important observation that occurred during the pilot study related to the checklist adaptability is how the client defined each e-learning criterion listed in the checklist. The indicators that the client identified for each of the e-learning criteria were not aligned with the definition/description of the criteria in the checklist. This shows how clients can perceive and adapt the checklist to their specific need.
Impact of ELEC Checklist on E-Learning Professionals

Based on the findings of the study, e-learning professionals reveal the ELEC checklist provides useful information and is useful for planning e-learning evaluation. One value of the ELEC checklist to the e-learning professionals who do not have evaluation experience is to provide them a step-by-step comprehensive tool that will guide them in the evaluation process. Even though some e-learning professionals might expect the ELEC checklist to address mainly technical aspects of the e-learning program, it is important to stress that this framework was intended to be broad. The rationale is that there are many other important factors that need to be considered when determining the effectiveness of e-learning programs. For e-learning professionals, this tool will provide them with most of the factors to consider in the evaluation of their e-learning programs. As with any checklist, it will allow them to consider other aspects that may have been otherwise overlooked. It is important to note that the technical aspect alone will not make an e-learning program successful. In addition, the ELEC checklist can be used along with other tools; it can complement existing tools that e-learners wish to use to implement more technical aspects in their evaluation.

To sum up, the ELEC checklist is not a substitute for content expertise, social research knowledge, and evaluation skills. In order for the ELEC checklist to be used properly, the evaluator or e-learning professional conducting the evaluation should have the following:

1. Good knowledge and understanding of e-learning programs, their functionality, and the technical aspect.
2. The ability to identify elements in the checklist that will be useful to the object of the evaluation in order to adapt the tool.

3. The expertise required to conduct a sound research/evaluation in order to properly apply the tool.

Future Research and Development of the ELEC

Based on the findings of this research, a few recommendations can be made for future research. Future research can build upon the ELEC checklist and, perhaps, narrow the scope of the checklist, thus addressing the broadness of the ELEC checklist.

Finally, as the field of e-learning and the evaluation of the e-learning programs advance, one would expect that new insights and ideas that are unique to the evaluation of e-learning programs will contribute to the revisions and improvements of the ELEC.

Related areas that may find the checklist of interest include blended learning, where the checklist can address programs that combine e-learning and face-to-face methods. E-learning evaluation in K–12 is also another growing area to consider. According to the North American Council for Online Learning (NACOL, 2007), K–12 education is rapidly expanding in both the number of programs and participants. Watson and Ryan (2007) reported that, as of September 2007, a total of 42 states have implemented either a supplemental online learning program or full-time program; some have even implemented both. Clayton, Horn, and Johnson (2008) also predicted that in the near future—less than 10 years—half of all high school courses will be conducted online.
Another area on which to focus the checklist is the e-learning accessibility criterion. Accessibility is a major concern in distance learning. The main goal of e-learning is to allow learners to access the learning material anytime from anywhere. If that cannot be fulfilled, then the main objective for e-learning cannot be met.

When using the accessibility criterion to focus the ELEC checklist, the aspect of e-learning for people with disabilities should be emphasized. In order for people with disabilities to benefit from e-learning, accessibility of the learning program via technology should be well implemented. This includes the aspect of the design, such as screen readers for sight-impaired and/or blind users, as well as other devices for hearing-impaired.

In addition to focusing the study, future research should include the use of case studies that will provide specific examples of how practitioners can use and incorporate the checklist.

It is important to note that the ELEC checklist is not an off-the-shelf e-learning evaluation tool ready to be used. This tool is still at the developmental stage and more time, testing, and collection of considerable amount of data are needed to make the tool more robust. Since the ELEC is a more macro-level tool, more needs to be done to adapt it to specific needs and applications. Methods and strategies that can be used to help users tailor the ELEC checklist to specific needs could be developed in the future. Hopefully, some users will see potential value in the ELEC checklist and further this research by testing the tool and providing more data. Publication of findings in journals related to e-learning and evaluation will add to the research as well.
Personal Note

The dissertation has resulted in a new checklist that hopefully will advance the field of evaluation practice. The process that led to this new checklist provided me, the author, with new knowledge and a stronger skill set related to collecting, analyzing, and reporting on qualitative and quantitative data. Through this study, I acquired a better understanding of conducting such valuable research. The challenges, layers of complexity, and obstacles that were overcome along the way have made me a much better scholar.
REFERENCES


Appendix A

ELEC Checklist and Glossary
Introduction

Purpose of ELEC
The E-Learning Evaluation Checklist* (ELEC) is intended to guide individuals in planning, designing, and conducting evaluations of e-learning programs. This framework can be used in three ways:

✓ It can serve as a set of prompts or reminders for professional evaluators
✓ It can serve as a more structured process guide for less experienced non-evaluators
✓ It can provide ideas about what might be useful, for example when negotiating or planning for an e-learning evaluation.

Intended users of ELEC
Anyone can benefit from using the checklist as a reminder of items they may have overlooked. However, non-evaluators (program directors, staff, and trainers) can benefit from the comprehensive and instructional nature of the checklist.

Characteristics of ELEC
Given the broad nature and the versatility of the ELEC, any organization (industry, higher education, non-profit) wishing to evaluate an e-learning program can adapt it to fit their specific need. ELEC advises individuals to (1) investigate the e-learning program background and context, descriptions and definitions, consumers, resources, and values, (2) evaluate e-learning process, outcomes, costs, and (3) determine overall significance of e-learning program and, if appropriate, make recommendations.

E-LEARNING EVALUATION CHECKLIST (ELEC)
The E-Learning Evaluation Checklist (ELEC) is a framework to guide the design and implementation of evaluations of e-learning programs. The ELEC is a sequential checklist and can help identify and correct problems. E-learning is a specific domain and has a set of technological terms that need to be learned. Although the ELEC was designed to be used across different organizations, the criteria to evaluate specific e-learning program may be based on the organization's goals, and specific needs. When using the checklist, each checkpoint should be followed and questions provided should be used to identify the information needed. Sources of information are specified in each section. It is important to note not all of the checkpoints need to be used during the evaluation process. It is always possible to go back to previous section in the checklist to make changes if necessary (i.e. if new information or problems are identified). ELEC has four major sections: (1) Preliminary Information Gathering, (2) Foundations of the Evaluation, (3) Learning, Outcomes, Costs, and (4) Conclusions and Implications.
It is recommended that potential users of ELEC try the checklist to familiarize before applying it. A glossary is provided to use with the checklist. A (*) will indicate terms explained in the glossary.
### Section 1: Preliminary, Information Gathering

In this phase information is gathered to help in planning the evaluation of e-learning program. Discussions should be held with participants and other interested person about the evaluation of the e-learning program. Topics for discussion include purpose of the evaluation, resources available, timeframe, as well as the data and information needed for the evaluation.

<table>
<thead>
<tr>
<th>Task</th>
<th>WHAT</th>
<th>Data Sources</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.1 Identify the contact person for the evaluation.</td>
<td>Who requested the evaluation?</td>
<td>Find who requested the evaluation</td>
</tr>
<tr>
<td>1.2 Clarify the purpose and intended users of the evaluation</td>
<td>What questions need answers? How do they intend to use the evaluation? Draft evaluation questions.</td>
<td>Talk to the contact person, users, ask questions.</td>
</tr>
<tr>
<td>1.3 Identify prospective audiences for the report.</td>
<td>Who should be informed of the evaluation during or at the end of the process?</td>
<td>Talk to the contact person, users, ask questions.</td>
</tr>
<tr>
<td>1.4 Identify stakeholders in the program.*</td>
<td>Who is affected by the program? Who has an interest in the evaluation?</td>
<td>Talk to the contact person, users, ask questions.</td>
</tr>
<tr>
<td>1.5 Clarify the role of the evaluator or evaluation team</td>
<td>Is the evaluator internal*, external*, or hybrid*.</td>
<td>Talk to the contact person, discuss the implications of the role of the evaluator for the evaluation design, execution, and reporting</td>
</tr>
<tr>
<td>1.6 Identify the nature and type of evaluation.</td>
<td>Is the evaluation formative* or summative*? Is it to identify financial worth* or merit*?</td>
<td>Talk to the contact person, users, ask questions.</td>
</tr>
<tr>
<td>1.7 Specify the timeframe to be used for the evaluation.</td>
<td>What phase of the program is of interest? beginning, middle, end, short/long term?</td>
<td>Talk to the contact person, users, ask questions.</td>
</tr>
<tr>
<td>1.8 Conduct a feasibility assessment of the evaluation.</td>
<td>Is the evaluation feasible? Are goals of the e-learning program appropriate, budget, time?</td>
<td>Talk to the contact person, users, ask questions, is there data available, cooperation, etc.</td>
</tr>
<tr>
<td>1.9 Identify the domain of expertise for the evaluation.</td>
<td>What type of knowledge is required for the evaluation?</td>
<td>Previous research and evaluations, technical knowledge.</td>
</tr>
<tr>
<td>1.10</td>
<td>Determine if sample has to be used and how it will be selected.</td>
<td>Sample representing all areas of the organization could be used for the e-learning evaluation.</td>
</tr>
<tr>
<td>1.11</td>
<td>Identify previous or existing cases that can be used for the evaluation</td>
<td>Success case model can be used to identify better ways of making e-learning program work.</td>
</tr>
<tr>
<td>1.12</td>
<td>Identify data collection and analytic procedures.*</td>
<td>Will data collected be qualitative, quantitative or both?</td>
</tr>
</tbody>
</table>

*see E-Learning evaluation glossary

## Section 2: Foundations of the Evaluation

This section investigates the context and nature of the program to be evaluated. It also identifies the value of e-learning program.

| 2.1 | Background and context. | What is to be evaluated: project, proposal, policy, program, outcome, or product? | Talk to the contact person, users, ask questions. |
| 2.2 | Descriptions and definitions of the object of the evaluation | Identify and define context, environment, the components, clients, learning outcomes | Talk to the contact person, users, ask questions. Review documentation. |
| 2.3 | Determine who is impacted by the evaluation. | Direct recipients of the program can be students and/or staffs. | Ask who participates in the program. |
| 2.4 | What are the current abilities, knowledge and willingness of participants | Are they comfortable with the idea of new learning technologies, able to use technology? | Ask e-learning program participants about comfort level and use of technology. |
| 2.5 | Identify technological resources available for e-learning. | What hardware, software, and network connectivity and capability are available? | Ask about available technology |
| 2.6 | Identify possible constraints of e-learning program. | Is there a lack of appropriate resources, manpower and technological? What is the organizational Culture? Is there a lack of management support? | Ask IT about systems information |
| 2.7 | Identify e-learning criteria for the evaluation | Criteria for e-learning evaluation identified through literature review that should be used for evaluation are design, usability, efficiency, accessibility, learning content, and effectiveness | Observation, course outlines, materials, learning objectives, outcomes, surveys. |
| 2.7.1 | Design Criteria | Design in e-learning involves the instructional strategies, content organization, media and interaction | Surveys, interviews, observations |
| 2.7.2 | Usability Criteria | Usability involves ease of use, navigation should be user-friendly and simple allowing users to access course online. The quality of e-learning and user satisfaction are enhance with good usability | Surveys, interviews, observations |
| 2.7.3 | Efficiency Criteria | Efficiency involves time and cost saving. Learners should be able to accomplish more in less time | Record review, surveys |
| 2.7.4 | Accessibility criteria | Accessibility involves the availability of the e-learning program anytime and anywhere. Accessibility should also consider learners with either physical disabilities, hearing or vision impairments | Survey, interviews |
| 2.7.5 | **Learning content criteria** | Learning content refers to learning objective. Learning modules contents should be aligned with learning objective and organizational goals. Learning objective should be clear and precise. | Document review, interviews, surveys |
| 2.7.8 | **Effectiveness criteria** | Effectiveness determines behavioral change on the job as a result of e-learning. E-learning effectiveness is also known as the learning outcome or impact referring to learners' knowledge and skills gained as a result of e-learning. Effectiveness of e-learning also assesses at learners' satisfaction. | Observation, pre and post t tests, surveys, interview |
| 2.8  | **Assign a weight to each criterion and rank criteria by weight.*** | Which criteria are more important than others? One of the following six strategies for strategies should be used: 1) vote by stakeholders or customers, 2) knowledge base of stakeholders, 3) literature review, specialists' judgment, 4) needs and value assessments, 5) program theory/casual linkages. | Ask stakeholders or clients, use literature review, specialist judgment, conduct needs or value assessment. |
| 2.9  | **Identify method of testing each criterion.** | Benchmarks for success in Internet-Based Distance Education prepared by the Institute for Higher Education Policy should be used to test each criterion. If the organization has established standards they should be used along with the Benchmarks for success. | Use tests, surveys, questionnaires, focus group, observation, and documentation to measure each criterion. |

*see E-Learning evaluation glossary
## Section 3: Learning, Outcomes, and Costs

This section focuses on the program activities the learning (process), the impact (outcomes), and the cost.

<table>
<thead>
<tr>
<th>Task</th>
<th>What</th>
<th>Data Sources</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>3.1</strong> Examine e-learning activities and procedures.</td>
<td>How do learners interact with the program? How is the log on process? How easy is the e-learning program to use?</td>
<td>Observations of learners or surveys of learners.</td>
</tr>
<tr>
<td><strong>3.2</strong> Examine the general learning process.*</td>
<td>How does learning occur once learners access the learning modules? Are learning modules content aligned with learning objectives?</td>
<td>Observations of learners, surveys, review of course outline content and learning objectives, focus group.</td>
</tr>
<tr>
<td><strong>3.3</strong> Examine the logic of e-learning program.*</td>
<td>What is to be learned and how is it presented. Are goals appropriate? Is adult learning theory used in the instructional design?</td>
<td>How is the e-learning program designed, do activities lead to learning outcomes.</td>
</tr>
<tr>
<td><strong>3.4</strong> Distinguish pre-program effects (see 2.4) from program effect.</td>
<td>How did learners react when new program was announced? How do learners react after using the new program? Are learners satisfied with the program?</td>
<td>Comparison of pre and post program surveys, knowledge tests, interviews, observations.</td>
</tr>
<tr>
<td><strong>3.5</strong> Identify rate of completion</td>
<td>What percentage of learners completes online courses or training modules? What are the reasons stated?</td>
<td>Open-ended surveys, interviews of learners, documentation review.</td>
</tr>
<tr>
<td><strong>3.6</strong> Identify unintended consequences*.</td>
<td>How does the e-learning program work? Is the e-learning program expected to work that way? (see checkpoint 2.2)</td>
<td>Learners’ experiences through Open-ended surveys, interviews or focus groups with learners about their experiences.</td>
</tr>
</tbody>
</table>
### Section 4: Conclusions & Implications

This section reports on the activities and findings of the evaluation.

<table>
<thead>
<tr>
<th>Task</th>
<th>What</th>
<th>Data Sources</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>4.1</strong> Create a performance profile for each criterion.*</td>
<td>The profile of each criterion identified in checkpoint 2.7 will provide the ranking and value for each criterion for the e-learning program.</td>
<td>Analysis of data collected for the program addressing learning and outcomes. Analysis will depend upon the questions asked.</td>
</tr>
<tr>
<td><strong>4.2</strong> Identify e-learning Strengths, Weaknesses, Opportunities, and Threats (SWOT)*</td>
<td>SWOT is a business procedure that can be applied to e-learning to identify areas of success and failure of e-learning.</td>
<td>All data gathered is analyzed to identify SWOT</td>
</tr>
<tr>
<td><strong>4.3</strong> Provide written draft for stakeholders’ assessments</td>
<td>A written draft allows stakeholders to provide feedbacks to evaluators and helps them understand data and recommendations as well as implications for practice</td>
<td>Analyzed data, tables, figures, graphs, charts, etc. Write report in language stakeholders will understand. – visual images are important in understanding.</td>
</tr>
<tr>
<td><strong>4.4</strong> Provide final written report to stakeholders.</td>
<td>Evaluator should edit the draft and provide a final report.</td>
<td>Analyzed data, tables, figures, graphs, charts, etc. Write report in language stakeholders will understand</td>
</tr>
<tr>
<td>4.5</td>
<td>Present the report to clients</td>
<td>Oral presentation of the findings is recommended.</td>
</tr>
<tr>
<td>4.6</td>
<td>Provide follow-up support if necessary and requested by stakeholders</td>
<td>Evaluator should have the opportunity to answer clients’ questions after the presentation.</td>
</tr>
</tbody>
</table>

*see E-Learning evaluation glossary*
Glossary

**Accessibility:** Involves the fact that e-learning should be available for use anytime and anywhere.

**Audience:** The audience for an evaluation is similar to consumers. This includes stakeholders needing to be informed of the evaluation either during the process or at the end of the evaluation (Scriven, 1991).

**Checklist:** Mnemonic tool used in evaluation to help and guide evaluators address all factors important, and related to the object of an evaluation.

**Client:** The person that officially requests the evaluation (Scriven, 2007).

**Cost Benefit Analysis (CBA):** Method determining if the benefit outweigh the cost in an investment. The present value of the benefits deriving from an investment are compare to the present value of the costs associated with that investment (Schniederjans, Hamaker, & Schniederjans, 2004).

**Criteria:** Criteria for an evaluation are attributes used to determine the effectiveness of the object of the evaluation.

**Critical Success Factor (CSF):** A factor that is crucial to the success of an organization (Baltzan, Phillips, & Haag, 2008, p.562).

**Design:** Involves the instructional strategies, content organization, media and interaction.

**Effectiveness:** Determines behavioral change on the job as a result of e-learning. E-learning effectiveness is also called the learning outcome or impact referring to learners' satisfaction, knowledge and skills gained as a result of e-learning.

**Efficiency:** Involves time and cost saving. Learners should be able to accomplish more in less time.

**Evaluation Models:** A theoretical framework, with a diagram including boxes or arrows, intended to guide evaluation studies (Ruhe & Zumbo, 2009).

**Evaluation:** The process of determining the merit, worth, or value of something (Scriven, 1991).

**Financial worth of the program:** More attention is given to cost analysis. Return on investment (ROI) and cost benefit analysis (CBA) should be used.

**Formative Evaluation:** An evaluation conducted to provide valuable evaluative information to improve a program. Formative evaluation is usually conducted during program development (Scriven, 1991).
**Information Technology (IT):** “All forms of technology used to create, store, exchange, and use data, information, and knowledge; also, the infrastructure of the networked economy.”

**Instructional Technology:** The process by which technology such as computers, networks, multimedia, and audiovisuals are used as tools for teaching and learning.

**Intangible costs:** Costs that can’t be expressed in monetary value. In e-learning those costs will be time away from work, system malfunction or down.

**Learning Content:** Refers to learning objective. Learning modules contents should be aligned with learning objectives and organizational goals. Learning objective should be clear and precise.

**Merit of program:** When evaluation is based on merit, greater emphasis is put on the success or failure of the program.

**Online learning (e-learning):** Electronic mean of delivering instruction. That involves the use of Internet, intranets, or multimedia (e.g., CD-ROM, DVD) (Smart & Cappel, 2006, p. 202).

**Return on Investment (ROI):** A financial analysis method used to draw a comparison between the rate of return on investment and the opportunity cost. This method determines if resources are being used profitably (Schniederjans, Hamaker, & Schniederjans, 2004, p.125).

**Stakeholders:** Anyone with an invested interest in the e-learning program to be evaluated or in the result of the evaluation. In e-learning this could be users of the program, program directors, management team, instructional designers, and staff.

**Summative Evaluation:** An evaluation conducted at the end of the program, and is used to determine continuation, expansion, or termination of a program (Scriven, 1991).

**Tangible costs:** Costs that can be expressed in dollar amount. In e-learning those will be hardware and software costs, labor costs.

**Unintended consequences:** Can be negative or positive, are either instructional or social (Ruhe & Zumbo, 2009)

**Usability:** Involves ease of use, navigation should be user-friendly and simple allowing users to access learning modules. The quality of e-learning and user satisfaction are enhanced with good usability.
Appendix B

Tables B1 and B2
Table B1: Rank Ordered ELEC Items for Each of the Expertise Groups

<table>
<thead>
<tr>
<th>E-learning Professional</th>
<th>Evaluation Professional</th>
<th>Other</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Item Number</strong></td>
<td><strong>Item Name</strong></td>
<td><strong>Mean</strong></td>
</tr>
<tr>
<td>4</td>
<td>Useful</td>
<td>4.41</td>
</tr>
<tr>
<td>13</td>
<td>Planning</td>
<td>4.00</td>
</tr>
<tr>
<td>5</td>
<td>Different</td>
<td>3.97</td>
</tr>
<tr>
<td>8</td>
<td>Wording</td>
<td>3.91</td>
</tr>
<tr>
<td>2</td>
<td>Understand</td>
<td>3.86</td>
</tr>
<tr>
<td>18</td>
<td>Framework</td>
<td>3.78</td>
</tr>
<tr>
<td>6</td>
<td>Clear</td>
<td>3.77</td>
</tr>
<tr>
<td>7</td>
<td>Sources</td>
<td>3.74</td>
</tr>
<tr>
<td>12</td>
<td>Needs</td>
<td>3.73</td>
</tr>
<tr>
<td>1</td>
<td>Complete</td>
<td>3.63</td>
</tr>
<tr>
<td>14</td>
<td>Data</td>
<td>3.62</td>
</tr>
<tr>
<td>17</td>
<td>Use</td>
<td>3.44</td>
</tr>
<tr>
<td>11</td>
<td>Concise</td>
<td>3.41</td>
</tr>
<tr>
<td>Item Number</td>
<td>Item Name</td>
<td>Mean</td>
</tr>
<tr>
<td>-------------</td>
<td>-----------</td>
<td>------</td>
</tr>
<tr>
<td>3</td>
<td>Easy</td>
<td>3.41</td>
</tr>
<tr>
<td>9</td>
<td>Criteria</td>
<td>3.38</td>
</tr>
<tr>
<td>15</td>
<td>Cost</td>
<td>3.35</td>
</tr>
<tr>
<td>10</td>
<td>Overlap</td>
<td>3.33</td>
</tr>
<tr>
<td>16</td>
<td>Methods</td>
<td>3.24</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Item Number</th>
<th>Item Name</th>
<th>Mean</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>9</td>
<td>Criteria</td>
<td>3.37</td>
<td>1.060</td>
</tr>
<tr>
<td>10</td>
<td>Overlap</td>
<td>3.25</td>
<td>0.886</td>
</tr>
<tr>
<td>16</td>
<td>Methods</td>
<td>3.25</td>
<td>0.886</td>
</tr>
<tr>
<td>14</td>
<td>Data</td>
<td>3.12</td>
<td>0.834</td>
</tr>
<tr>
<td>15</td>
<td>Cost</td>
<td>3.12</td>
<td>0.991</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Item Number</th>
<th>Item Name</th>
<th>Mean</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>Easy</td>
<td>3.71</td>
<td>0.951</td>
</tr>
<tr>
<td>11</td>
<td>Concise</td>
<td>3.71</td>
<td>0.487</td>
</tr>
<tr>
<td>16</td>
<td>Methods</td>
<td>3.57</td>
<td>0.975</td>
</tr>
<tr>
<td>10</td>
<td>Overlap</td>
<td>3.42</td>
<td>0.788</td>
</tr>
<tr>
<td>15</td>
<td>Cost</td>
<td>3.42</td>
<td>1.272</td>
</tr>
</tbody>
</table>

*Items full names and descriptions

1. The checklist is **useful**
2. The checklist is easy to **understand**
3. The checklist is easy to use
4. The checklist provides **useful** information
5. The checklist will be applicable to different types of organizations
6. The checklist provides **clear** direction for evaluating e-learning
7. The checklist is useful for identifying information sources for e-learning evaluation
8. The checklist’s wording is clear
9. The checklist’s criteria for evaluating e-learning are complete
10. The checklist’s criteria for evaluating e-learning do not overlap
11. The checklist’s criteria for evaluating e-learning are concise
12. The checklist is useful in identifying the needs of the client
13. The checklist is useful for planning e-learning evaluation
14. The checklist is useful for determining appropriate e-learning data collection method
15. The checklist is useful for identifying costs associated with e-learning
16. The checklist is useful in selecting appropriate methods for e-learning criteria ranking
17. The checklist is a tool that respondents are willing to use to conduct e-learning evaluation
18. The checklist is overall a good framework for e-learning evaluation
Table B2: T-Test Comparison for Evaluators and E-learning Professionals

_T-Test Results Comparing Evaluation Professionals with E-learning Professionals_

<table>
<thead>
<tr>
<th>Item Number</th>
<th>Item Name</th>
<th>T-Test Findings</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Is complete</td>
<td>$t(42) = -0.27, p=0.7912$</td>
</tr>
<tr>
<td>2</td>
<td>Is easy to understand</td>
<td>$t(42) = -0.43, p=0.6673$</td>
</tr>
<tr>
<td>3</td>
<td>Is easy to use</td>
<td>$t(42) = -0.21, p=0.8374$</td>
</tr>
<tr>
<td>4</td>
<td>Provides useful information</td>
<td>$t(40) = 0.76, p=0.4528$</td>
</tr>
<tr>
<td>5</td>
<td>Will be applicable to different types of organizations</td>
<td>$t(41) = 0.33, p=0.7456$</td>
</tr>
<tr>
<td>6</td>
<td>Provides clear direction for evaluating e-learning</td>
<td>$t(41) = 0.75, p=0.4730$</td>
</tr>
<tr>
<td>7</td>
<td>Is useful for identifying information sources for e-learning evaluation</td>
<td>$t(40) = -1.69, p=0.0991$</td>
</tr>
<tr>
<td>8</td>
<td>Wording is clear</td>
<td>$t(41) = 0.24, p=0.8134$</td>
</tr>
<tr>
<td>9</td>
<td>Criteria for evaluating e-learning are complete</td>
<td>$t(39) = 0.03, p=0.9745$</td>
</tr>
<tr>
<td>10</td>
<td>Criteria for evaluating e-learning do not overlap</td>
<td>$t(41) = 0.21, p=0.8330$</td>
</tr>
<tr>
<td>11</td>
<td>Criteria for evaluating e-learning are concise</td>
<td>$t(40) = -1.53, p=0.1329$</td>
</tr>
<tr>
<td>12</td>
<td>Is useful in identifying the need of the client</td>
<td>$t(39) = -0.30, p=0.7662$</td>
</tr>
<tr>
<td></td>
<td>Description</td>
<td>t (df)</td>
</tr>
<tr>
<td>---</td>
<td>-----------------------------------------------------------------------------</td>
<td>--------</td>
</tr>
<tr>
<td>13.</td>
<td>Is useful for planning e-learning evaluation</td>
<td>-0.66</td>
</tr>
<tr>
<td>14.</td>
<td>Is useful for determining appropriate e-learning data collection method</td>
<td>1.18</td>
</tr>
<tr>
<td>15.</td>
<td>Is useful for identifying costs associated with e-learning</td>
<td>0.59</td>
</tr>
<tr>
<td>16.</td>
<td>Is useful in selecting appropriate methods for e-learning criteria ranking</td>
<td>-0.02</td>
</tr>
<tr>
<td>17.</td>
<td>Is a tool that respondents are willing to use to conduct e-learning evaluation</td>
<td>0.20</td>
</tr>
<tr>
<td>18.</td>
<td>Is overall a good framework for e-learning evaluation</td>
<td>0.71</td>
</tr>
<tr>
<td></td>
<td>Ease of Use Index</td>
<td>-0.53</td>
</tr>
<tr>
<td></td>
<td>Completeness of Content Index</td>
<td>-0.29</td>
</tr>
<tr>
<td></td>
<td>Criteria Total</td>
<td>-0.83</td>
</tr>
</tbody>
</table>
Appendix C

Experts Invitation Letter and Feedback Survey Form
Dear Expert Review Panel Members:

I want to thank you for expressing your willingness to serve as a panel member that will review an initial draft of the E-Learning Comprehensive Checklist (ELEC). The ELEC is a checklist intended to help design and implement e-learning program evaluation. This tool is intended for use by professional evaluators as well as e-learning professionals that oversee e-learning programs, such as program directors, and project coordinators. Initially, it is my assumption that this tool is intended for e-learning programs that are asynchronous and involve self-paced learning.

Please review the checklist and complete the accompanying feedback form. You are also welcome to include comment in the electronic file containing the actual checklist. Alternatively, you can print the checklist and include comments on a hard copy of the checklist. Candid and detailed comments will be most helpful for improving this tool. I assume the review process will require around two hours of your time. The timeframe for this review is two weeks. Upon completion of your review, please return the feedback form and other comments to me by email <anne.oulai@wmich.edu> or fax at 269-808-0841.

After I receive feedback from the expert review panel, I will revise the instrument and move to phase 2 of my dissertation which will involve piloting the instrument. There will also be a third phase in the development of this tool which will include an on-line survey of practitioners and evaluators. I am planning to complete the dissertation research and finalized this framework during the summer. I will be pleased to share with you a copy of the final version of the ELEC later in the summer.

Sincerely,

Anne-Marie Oulai
E-Learning Comprehensive Checklist (ELEC)

Structured Feedback Form for Expert Review Panel Members

Completed educational level

☑ High school ☐ Bachelors degree ☐ Doctoral degree
☐ Associate’s degree ☐ Masters degree

Your Organization ____________________________
Your Department ____________________________
Your Occupation ____________________________

Have you ever participated in online training or education? ☐ No ☐ Yes
Briefly explain: ________________________________________________________________

Have you developed online training or education? ☐ No ☐ Yes
Briefly explain: ________________________________________________________________

Do you work with online training or education in any capacity? ☐ No ☐ Yes
What capacity?
________________________________________________________________________
Indicate your rating by circling the corresponding number.

<table>
<thead>
<tr>
<th>Rate your knowledge and familiarity with evaluation</th>
<th>Not at all familiar</th>
<th>Very familiar</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>Comments:</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Rate your knowledge and familiarity with e-learning</th>
<th>Not at all familiar</th>
<th>Very familiar</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>Comments:</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Strongly Disagree</th>
<th>Disagree</th>
<th>Neutral</th>
<th>Agree</th>
<th>Strongly Agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Checklist is complete</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>Comments:</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<p>| 2. Checklist wording is clear | 1 | 2 | 3 | 4 | 5 |
| Comments:                     |   |   |   |   |   |</p>
<table>
<thead>
<tr>
<th></th>
<th>Strongly</th>
<th>Disagree</th>
<th>Neutral</th>
<th>Agree</th>
<th>Strongly Agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>3. The checklist is easy to use</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>Comments:</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. The checklist is coherent</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>Comments:</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. The checklist provides useful information</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>Comments:</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
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<td>Disagree</td>
<td>Neutral</td>
<td>Agree</td>
<td>Strongly Agree</td>
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<td>7. The checklist will be applicable to different types of organizations</td>
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<td>9. Criteria of merit are not overlapping</td>
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<td>10. Criteria of merit are concise</td>
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</tbody>
</table>

**Comments:**

What are the strengths of the checklist?
What are the weaknesses of the checklist?

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________

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What topics or areas do you believe need further clarification?

________________________________________________________________________

________________________________________________________________________

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________________________________________________________________________

________________________________________________________________________

Thanks for taking the time to review this checklist and sharing your insights and comments.
Please return this completed form within two weeks. Also, if you have included comments or suggestions on the actual checklist, please send these to me by e-mail, fax, or regular mail.

Email: anne.oulai@wmich.edu

Fax: 269-808-0841

Address: Anne-Marie Oulai

7737 Shepherds Glen Rd

Kalamazoo, MI 49009
Appendix D

Pilot Study Criteria Ranking Form
Pilot Study Criteria Ranking Form

Indicate your rating of each criterion by circling the corresponding number.

<table>
<thead>
<tr>
<th></th>
<th>Not at all Important</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>Very Important</th>
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<tr>
<td><strong>Usability</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
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<td></td>
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<tr>
<td>• Ease of use</td>
<td></td>
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<tr>
<td>• Navigation of the platform</td>
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<tr>
<td></td>
<td>Please comment on the appropriateness of the indicators.</td>
<td></td>
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<td><strong>Efficiency</strong></td>
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<td>Indicators of efficiency:</td>
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<tr>
<td>• Students are able to complete their degree or course work in less time</td>
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<td>• University offer more courses at cheaper cost</td>
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<td>Please comment on the appropriateness of the indicators.</td>
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<td><strong>Accessibility</strong></td>
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<td>Indicators of accessibility:</td>
<td></td>
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<tr>
<td>• Accessing the technology</td>
<td></td>
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<tr>
<td>• Accessing the course module</td>
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<td>• Student’s awareness of the continuous availability of the course</td>
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<td>Please comment on the appropriateness of the indicators.</td>
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<td><strong>Effectiveness</strong></td>
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<td>Indicators of effectiveness:</td>
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<tr>
<td>• Student credit hours (SCH)</td>
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<tr>
<td>• Enrollment rate</td>
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<tr>
<td>• Completion rate</td>
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<td>Please comment on the appropriateness of the indicators.</td>
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</tbody>
</table>
Appendix E

Open Learning Evaluation Plan Proposal
Checklist for Evaluating E-learning in Organizations

by

Anne-Marie Oulai
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1. Introduction

1.1 Description of the Open Learning Program

Open Learning Program (OLP) provides self-paced asynchronous e-learning courses to Western Michigan University students. The program was initiated by the Academic Technology and Instructional Services (ATIS) at Western Michigan University. The program started in January of 2009 and has an enrollment of 78 students. Open Learning is an open entry/open exit program allowing students to register anytime during the course of the semester. OLP uses a semester based frame but there is an overlap between semesters. Courses are offered at undergraduate level, however, graduate students can register if they are in need of an undergraduate course for their degree completion. Courses offered through the program are general education courses. The goal of the program is to provide educational opportunities to prospective students wishing to take courses but aren’t able to come on campus to take the traditional face-to-face courses. The purpose of the program is to offer a supplemental learning modality to the university learning process. OLP is a good source for students looking to take an internship course as well as completing a course work within a time frame that isn’t compatible with the university academic calendar.

The asynchronous e-learning program provides flexibility, and convenience through a self-paced learning environment. Students are not required to be on campus, they can access course modules through intranet, the university private network, in this case Blackboard. Students have the possibility to revisit learning modules many times. Nine courses are offered and there are seven instructors. At this point of time, only students who are officially accepted at Western Michigan University and have a WIN number can register for courses with OLP. Registration process follows the same procedure as university regular courses enrollment. Students use the university’s student information system banner to select and register for their courses.

Once students are enrolled in the program they receive a letter of acceptance in the mail, this letter explained how the program works. A post card with courses offering is also send to the student via mail. Students are also sent email through the university email account and through their personal email account. However, students are strongly encouraged to use their university email account for further correspondences regarding their courses. An initial optional face-to-face orientation is scheduled at the beginning of each semester to give students the opportunity to get familiar with the program process. Students have up to six months to complete their course work starting the day of their registration. Students can request an extension up to three months, however, the course completion time should not exceed nine months. The extension length is determined by the instructor. The request for extension should be submitted at least 14 days before the end of the initial six months period allowed. International students and students who
receive financial aid are required to complete their coursework within the semester of enrollment. This requirement is based on government regulations. Tuition is based on student's status (undergraduate or graduate). The tuition is the same for all students regardless of their residence status. There is a mandatory $20.00 technology fee per course. Undergraduate tuition is set at a rate of $297.46 per credit hour, and graduate is $420.50 per credit hour for the 2008-09 academic year.

Faculty selection is conducted through all colleges in the university. Courses are offered only by Faculty from Western Michigan University. Faculty with extensive knowledge on e-learning courses and previous experience in teaching online are encouraged to teach courses through open learning. Faculties are responsible for course content. OLP can only provide technical support to faculty for their courses offering. Faculty members are paid $70.00 per credit hour per student.

1.2 Extended University Programs and ATIS Description

1.2.1 Extended University Programs (EUP) at Western Michigan University provides non-traditional education programs. EUP provides graduate and undergraduate degree programs, non-credit programs, professional development, and personal enrichment options. EUP's mission statement is "The mission of Extended University Programs is to provide enhanced access to higher education for a greater constituency than could otherwise attend a central campus". EUP's vision is "To be a locally, regionally, nationally, and internationally recognized leader in lifelong learning". EUP has campuses in Battle Creek, Grand Rapids, Lansing, Muskegon, Southwest, and Traverse City as well as online learning options. EUP has two major branches: ATIS and OLLE. (see Figure 1 for EUP organizational chart)

ATIS (Academic Technology & Instructional Services) provides multiples e-learning modalities such as online, compressed video-interactive television (CVIT) courses. Open Learning is one of the online programs under ATIS.

OLLE (Office of Lifelong Learning and Education) offers certificate programs, credit and non-credit workshops, professional seminars, and Continuing Education. OLLE also offers conference development, planning, and management services.
1.2.2 **ATIS (Academic Technology and Instructional Services) Program Description**

ATIS which is part of Exam tended University Programs (EUP) initiated the open learning program (OLP). ATIS has four major functions:

1) Recruit, train and support instructors
2) Provide instructional design for online courses
3) Marketing and recruitment of students
4) Provide support to students (face-to-face, and online support)

1.3 **Client, audiences, and stakeholder:**

The client for this evaluation is ATIS which is responsible for open learning program. The persons of contact or liaison for the evaluation are the program director, and the interim director of ATIS.

The audience for the evaluation includes:

- ATIS which is the organization providing the program
- The Associate vice-provost
- The Provost and staff in the provost office
- The Director of the program
- The office of Business and Finance at EUP
- ATIS staff (instructional designers).
The stakeholders include:
✓ The audience previously mentioned
✓ Faculties who provide the learning modules
✓ Students who participate in the program
✓ Western Michigan University

1.4 Nature and timeframe for the evaluation
Since this is a new program, this evaluation will be a formative evaluation which will help identify areas for changes in the program. This evaluation will help determine if the program is meeting the goals and objectives. The nature of this evaluation is to determine the merit of the program so greater emphasis will be put on the quality of the program which will focus on success or failure of the program. The program being so new the timeframe is at the beginning of the program which is a short-term period.

1.5 Evaluation’s feasibility assessment
Based on information and documentation collected about the EUP program, a formative evaluation can be conducted. The goals of the program were clearly stated, the goals are plausible. The key measures needed for the evaluation are completion rate, student satisfaction program functionality, information needed to conduct the evaluation could be accessible. This evaluation could be utilized to make changes to the program as necessary.

1.6 Data collection procedure & sample selection

1.6.1 Sample selection: information needed to conduct the evaluation will come from different sources. Most of the questions will be answered from the feedback gathered from students who participate in the program. Other important sources of information will be the program coordinator, ATIS Director, as well as the staff. The sample selection will be as followed:
✓ Faculty providing the course, faculty teaching the most courses would be selected to allow a great deal of information to be collected.
✓ Instructional designers since there is a limited number of instructional designers, they will all be asked to participate in the evaluation
✓ Students enrolled in the program will be asked at the time of the enrollment to voluntarily participate in the study.
✓

1.6.2 Data collection methods: the majority of the data will be collected using three methods:
✓ Surveys (online)
✓ Records reviews (Program documents)
✓ Interviews (face-to-face, phone, or online through email)
1.7 Rational for the data collection methods: the three methods of data collection mentioned are necessary to gather information needed for the evaluation. Surveys will be used to determine opinions and suggestions about the program. Survey is used because it is a method that allows to reach more people, it is an efficient method of data collection and more accurate because of anonymity. Since this program covers a large geographic area, survey will be the most reasonable way to reach a larger audience. Students, staffs, faculty and instructional designers from all campuses will be surveyed. Surveys will be conducted online and via emails. The second method of data collection records review (documentation) including enrollment record, courses completed etc. will be used in order to keep track of the program progress and outcome. Records review will allow the evaluator to have written documents that can be analyzed and help in determining where the program stands and how it has been used and implemented. The third method, interview, will be conducted through few stakeholders and students. Since interviews are time consuming and also hard to schedule in order to accommodate everyone involved, selected stakeholders will be interviewed. The stakeholders who will be interviewed are the one directly involved in the implementation of the program. Potential interviewees are the director of ATIS, Open Learning Program coordinator, faculty, instructional designers and students. Interviews will allow follow-up questions and open doors for new questions and answers as well as comments and suggestions.

1.8 Potential problems with data collection: Few problems can be anticipated in the data collection. Sample size can be a problem if many students are not willing to participate in the study. Also the sample may not be representative of all campuses which can cause a problem with the data analysis. Another problem that can be anticipated is accessing documentation for records review. For instance, some information on students' record may be confidential therefore the evaluator would not be able to identify specific students who completed or failed to complete a course.

1.9 Analysis and interpretation of data collected: Both qualitative and quantitative analysis of the data collected will be used for data interpretation. Since numeric and descriptive data will be collected through the evaluation, it is necessary to combine both methods. This process known as mixed method is a good way to learn more about the program being evaluated. The advantage of mixed method is that one method can reveal information missed in another method, thus both methods complement each other while increasing the validity of the data. The qualitative method will be used for the narrative data such as verbal descriptions, opinion, recommendations recorded through the open-ended surveys, interviews and record review. The quantitative method will be used for data that produce numerical information. For example the number of student who complete or fail to complete a course will be analyzed using quantitative method. Table 1 provides a description of the data collection instruments.
### Table 1: List and Description of Data Collection Instrument

<table>
<thead>
<tr>
<th>Data Sources</th>
<th>Instrument</th>
<th>Information To Be Collected</th>
<th>Tentative Schedule</th>
</tr>
</thead>
<tbody>
<tr>
<td>Students</td>
<td>Pre &amp; post tests</td>
<td>Students’ knowledge, behavior before and after completing a course. Feedbacks on course</td>
<td>Jan. 5, 2010 pre-test</td>
</tr>
<tr>
<td></td>
<td>Surveys, interviews</td>
<td>completion rate</td>
<td>July 5, 2010 post-test</td>
</tr>
<tr>
<td>Faculty</td>
<td>Surveys</td>
<td>Course design and content, instructional design support modules functionality, students</td>
<td>Feb. 20&lt;sup&gt;th&lt;/sup&gt; to</td>
</tr>
<tr>
<td></td>
<td>Interviews</td>
<td>interaction</td>
<td>April 23&lt;sup&gt;rd&lt;/sup&gt;,</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>2010</td>
</tr>
<tr>
<td>Staff</td>
<td>Surveys</td>
<td>Reaction to the new program, level of technical knowledge</td>
<td>Jan. 20&lt;sup&gt;th&lt;/sup&gt; to</td>
</tr>
<tr>
<td></td>
<td>Interview</td>
<td></td>
<td>February 10&lt;sup&gt;th&lt;/sup&gt;</td>
</tr>
<tr>
<td>Program Director</td>
<td>Interview</td>
<td>Rate of completion</td>
<td>January 10&lt;sup&gt;th&lt;/sup&gt;</td>
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<td>Coordinator</td>
<td>Record Review</td>
<td>Enrolment status</td>
<td>June 10, 2010</td>
</tr>
</tbody>
</table>

### 1.10 Qualifications of Evaluation Contractors

This evaluation is conducted by an external evaluator from Western Michigan University. The evaluator Anne-Marie Oulai is a Ph.D. candidate in Evaluation Measurement and Research at WMU. This evaluation plan is one of the three phases of the evaluator’s dissertation. The evaluation plan is conducted with the assistance and under the supervision of Dr. Gary Miron who is the committee chair for the dissertation. Dr. Gary Miron is a professor in the department of Educational Leadership, Research & Technology (ELRT) at Western Michigan University’s College of Education. Dr. Gary Miron has extensive experience conducting evaluation of school reforms and education policies.
2 Foundations of OLP Evaluation

2.1 Background and context of OLP program: The main focus of the evaluation is the modality. Asynchronous e-learning environment. The program was already described and defined in the preface. Based on the program description provided by the client, and the initial contact with the program coordinator and the interim director of ATIS, the program can be described through four main goals:

1) Reach a broader student population by providing new modality of course delivery
2) Allow students to complete their coursework at their own pace
3) Help students meet their educational goals
4) Reduce attrition

2.2 Resources of OLP: resources for the program include manpower and technological resources. Manpower includes staff of ATIS who provide technical support to students and faculty. Faculty members are also experienced in e-learning teaching. The technological resources include the blackboard vista* that students use to access course module, the hardware, software and network capabilities allowing online chat, blackboard discussions.

2.3 Potential constraints of OLP: technical problems such as students not being able to access the program. Technology required by students to be able to access the program. Some courses may not be offered through the program.

2.4 Criteria for evaluation of OLP: criteria identified by program director and ATIS interim director and discussed with the evaluators are as followed:

Table 2: Criteria for the Evaluation

<table>
<thead>
<tr>
<th>Usability</th>
<th>Efficiency</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Ease of use of vista blackboard</td>
<td>• Students are able to complete their degree or course work in less time with more flexibility</td>
</tr>
<tr>
<td>• Navigation of the platform</td>
<td>• University offer more courses at cheaper cost</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>Accessibility</td>
<td></td>
</tr>
<tr>
<td>• Accessing the technology</td>
<td></td>
</tr>
<tr>
<td>• Accessing the course module</td>
<td></td>
</tr>
<tr>
<td>• Students’ awareness of the continuous availability of the course</td>
<td></td>
</tr>
</tbody>
</table>
Effectiveness

- Student credit hours (SCH)
- Enrollment rate
- Completion rate
- Attrition rate

2.5 Criterion Ranking for OLP:
The process used to rank the criterion is the vote by stakeholders. In this method stakeholders were asked through a survey to rate the importance of the criteria discussed in 2.9. A table ranking the criteria of merit on a scale of 1-5 was sent to limited number of key stakeholders (the program director, ATIS interim director and an instructional designer) see table below for criteria ranking. Once all three assign a weight to each criterion, the total for each criterion is computed and the average is then done. The average for each criterion was used to rank the criteria.

Table 3: Criteria ranking by stakeholders’ vote

<table>
<thead>
<tr>
<th>Criterion</th>
<th>Rank</th>
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<tbody>
<tr>
<td>1. Accessibility</td>
<td>5</td>
</tr>
<tr>
<td>2. Effectiveness</td>
<td>4.8</td>
</tr>
<tr>
<td>3. Efficiency</td>
<td>4.5</td>
</tr>
<tr>
<td>4. Usability</td>
<td>4</td>
</tr>
</tbody>
</table>

2.6 Identifying method of testing for each criterion
Criteria will be measured qualitatively and quantitatively. OLP will provide their target goal for each criterion and the criterion will be measured against those benchmarks. For instance if the program has a target for number of students who should register per semester, this target will be used to draw a comparison with the actual number of students who registered each semester. The second method that will be used to measure the criteria is the Benchmarks for Success in Internet-Based Distance Education prepared by The Institute for Higher Education Policy (www2.nea.org/he/abouthe/images/quality.pdf). This document provides benchmarks that can be used to measure the general quality of online education. This document provides a list of 24 benchmarks that are critical for e-learning success. Those criteria are grouped in seven major categories: (1) Institutional support benchmark, (2) courses development benchmarks, (3) teaching/learning benchmarks, (4) course structure benchmark, (5) student support benchmarks, (6) faculty support benchmarks, and (7) evaluation and Assessment benchmarks. See table 4 below for criteria measurement methods.
Table 4: Method used for criterion measurement

<table>
<thead>
<tr>
<th>Criterion</th>
<th>Method</th>
<th>Instrument</th>
<th>Data Sources</th>
</tr>
</thead>
<tbody>
<tr>
<td>Accessibility</td>
<td>Benchmarks</td>
<td>Survey, interview</td>
<td>Students, faculty</td>
</tr>
<tr>
<td>Effectiveness</td>
<td>Standards</td>
<td>Record review, interview</td>
<td>Documentation, OLP coordinator</td>
</tr>
<tr>
<td>Efficiency</td>
<td>Standards</td>
<td>Record review, interview</td>
<td>Documentation, students, coordinator</td>
</tr>
<tr>
<td>Usability</td>
<td>Benchmarks</td>
<td>Survey, interview</td>
<td>Students, faculty, IT staff</td>
</tr>
</tbody>
</table>

3. Learning, Outcomes, and Costs evaluation:

3.1 *Learning activities and procedures*: this includes the process that students/learners go through. Students log on to the systems through e-learning. Students use their WIN number to access the university blackboard vista, once in the blackboard, they have a list of the courses they are taking, and they can select the course module they need to study. Observations and surveys of learners will be used as data collection method for the procedure.

3.2 *Distinguish pre-program effects from program effects*: pre and post knowledge tests will be administer to students to determine their knowledge skills before and after completing the course. Comparison of the data collected on pre and post knowledge skills will be conducted. Students will also be surveyed and interviewed, before and after completion of a course to see if there is a change in their behavior after completing the course.

3.3 *Identify rate of completion*: documentation or records will be used to determine how many students complete the course once they start it. Open-ended surveys as well as interviews will be conducted to identify the reasons why students fail to complete the course and also get feedbacks on those you have completed the courses. The rate of completion is important because it is identified as one of the major problems with asynchronous online learning. Since this is a self-paced program, problems with completion rate may not be caused by program itself; instead it may be a problem with learners themselves.
3.4 **Identify unintended consequences:** those consequences that can be positive or negative and were not expected as the result of the program. To determine if there are unintended consequences, the evaluator will find out learner’s experiences through open-ended surveys and interviews.

3.5 **Identify program costs:** the program costs include the tangible costs for hardware and software and network cost, marketing cost, faculty compensation, staff wages and salaries, CVIT site coordinators, variable instructional expenses, Kalamazoo campuses initiatives, and new program initiatives costs. Evaluator will determine if there are any intangible costs based on data collected.

4 **Conclusions & Implications**

4.1 The findings for the evaluation of OL will be reported in this section. A profile for each of the criterion identified and ranked by the client (see 2-4-2.5) will be created. The profile for each criterion will be based on the analysis of data collected through program documentation, surveys and interviews with staff and learners. All data collected will be analyzed and a SWOT (Strengths Weaknesses, Opportunities, and Threats) analysis which is a business procedure will be used to identify areas of success and failure of OL program. An initial written draft including data analysis, figures, tables, graphs and/or charts will be provided stakeholders for assessment. Upon review of the draft, stakeholders will provide feedbacks that the evaluator will use to make the final report. An oral presentation of the finding will be conducted using power points, tables, figures, and graphs to illustrate the findings. The audience will have the opportunity to get their questions answered.

4.2 Format of Final Report

The following report format will be used to present the findings of the evaluation:

1. Executive Summary
2. Introduction
3. Evaluation plan and Procedures
4. Evaluation Results
5. Conclusions and Recommendations
6. Appendices
Appendix F

Online Survey Invitation Letter and Online Survey Instrument
Dear Colleague:

You are invited to participate in an e-learning evaluation survey which is part of my dissertation study.

This survey is completely anonymous; no responses will be individually identified, they are confidential.

The survey is being conducted by Anne-Marie Oulai, a doctoral student at Western Michigan University under the supervision of Dr. Gary Miron, who is the dissertation chair. It will take you about an hour to complete the survey this includes reviewing a checklist that will be sent to you.

If you have filled out the survey, you also have the option to enter a random drawing to receive one of five $50 visa gift cards, which can be used anywhere.

If you are interested in participating in this study, please reply by email at anne.oulai@wmich.edu and the link to the survey will be sent to you.

Thank you for your interest, your input will be valuable to this study.

Sincerely,

Anne-Marie Oulai
Online Survey Instrument

1. What is your gender?
☐ Male    ☐ Female

2. What is your age?
☐ 18-24   ☐ 25-39   ☐ 40-54   ☐ 55-69   ☐ 70-99

3. What is the highest academic degree you have attained?
☐ Bachelors degree
☐ Masters degree
☐ Doctoral degree
☐ Other (please specify)

*4. What is your area of expertise?
☐ E-learning
☐ Evaluation
☐ Both
☐ Other (please specify)

*5. Have you ever participated in online training or education?
☐ Never   ☐ Occasionally (1 or 2 courses)   ☐ Frequently (3-5 courses)   ☐ All the time (more than 5 courses)

Please explain or share your comments

(Optional)
6. Have you ever developed online training or education?
- Never
- Occasionally (once or twice)
- Frequently (3-5 times)
- All the time (this is focus of my work)

Please explain or share your comments

(Optional)

7. Do you work with online training or education?
- Never
- Occasionally (once or twice)
- Frequently (3-5 times)
- All the time (this is focus of my work)

Please explain or share your comments

(Optional)

ELEC Checklist Critical Feedback Survey - 1

For each of the following statements about the ELEC (E-learning Evaluation Checklist) checklist, indicate your rating by selecting the number that best reflects the extent to which you agree or disagree.

8. Do you think the ELEC checklist is complete?
- Strongly disagree
- Disagree
- Neutral
- Agree
- Strongly agree

Please explain or share your comments

(Optional)

9. Do you think the ELEC checklist is easy to understand?
<table>
<thead>
<tr>
<th>10. Do you think the ELEC checklist will be easy to use?</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="Strongly_Agree.png" alt="Strongly Agree" />  <img src="Disagree.png" alt="Disagree" />  <img src="Neutral.png" alt="Neutral" />  <img src="Agree.png" alt="Agree" />  <img src="Strongly_Agree.png" alt="Strongly Agree" /></td>
</tr>
<tr>
<td>please explain or share your comments</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>11. Do you think the ELEC checklist provides useful information?</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="Strongly_Agree.png" alt="Strongly Agree" />  <img src="Disagree.png" alt="Disagree" />  <img src="Neutral.png" alt="Neutral" />  <img src="Agree.png" alt="Agree" />  <img src="Strongly_Agree.png" alt="Strongly Agree" /></td>
</tr>
<tr>
<td>please explain or share your comments</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>12. Do you think the ELEC checklist will be applicable to different types of organizations?</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="Strongly_Agree.png" alt="Strongly Agree" />  <img src="Disagree.png" alt="Disagree" />  <img src="Neutral.png" alt="Neutral" />  <img src="Agree.png" alt="Agree" />  <img src="Strongly_Agree.png" alt="Strongly Agree" /></td>
</tr>
<tr>
<td>please explain or share your comments</td>
</tr>
</tbody>
</table>
13. Do you think the ELEC checklist provides clear direction for evaluating e-learning?

- [ ] Strongly disagree
- [ ] Disagree
- [ ] Neutral
- [ ] Agree
- [ ] Strongly agree

Please explain or share your comments

(Optional)

14. Is the ELEC checklist useful for identifying information sources for e-learning evaluation?

- [ ] Strongly disagree
- [ ] Disagree
- [ ] Neutral
- [ ] Agree
- [ ] Strongly agree

Please explain or share your comments

(Optional)

15. Do you think the ELEC checklist wording is clear?

- [ ] Strongly disagree
- [ ] Disagree
- [ ] Neutral
- [ ] Agree
- [ ] Strongly agree

Please explain or share your comments

(Optional)

16. Do you think the ELEC checklist's criteria for evaluating e-learning are complete?

- [ ] Strongly disagree
- [ ] Disagree
- [ ] Neutral
- [ ] Agree
- [ ] Strongly agree

Please explain or share your comments

(Optional)
ELEC Checklist Critical Feedback Survey - 2

For each of the following statements about the ELEC (E-learning Evaluation Checklist) checklist, indicate your rating by selecting the number that best reflects the extent to which you agree or disagree.

17. Do you think the ELEC checklist's criteria for evaluating e-learning are not overlapping?
- Strongly Disagree
- Neutral
- Agree
- Strongly agree

Please explain or share your comments

(Optional)

18. Do you think the ELEC checklist's criteria for evaluating e-learning are concise?
- Strongly Disagree
- Neutral
- Agree
- Strongly agree

Please explain or share your comments

(Optional)

19. Do you think the ELEC checklist is useful in identifying the need of the client?
- Strongly Disagree
- Neutral
- Agree
- Strongly agree

Please explain or share your comments

(Optional)
20. Do you think the ELEC checklist is useful for planning e-learning evaluation?

☐ Strongly Disagree ☐ Neutral ☐ Agree ☐ Strongly Agree

Please explain or share your comments

(Optional)

21. Do you think the ELEC checklist is useful for determining appropriate e-learning data collection method?

☐ Strongly Disagree ☐ Neutral ☐ Agree ☐ Strongly Agree

Please explain or share your comments

(Optional)

22. Do you think the ELEC checklist is useful for identifying cost associated with e-learning evaluation?

☐ Strongly Disagree ☐ Neutral ☐ Agree ☐ Strongly Agree

Please explain or share your comments

(Optional)

23. Do you think the ELEC checklist is useful in selecting appropriate methods for e-learning criteria ranking?

☐ Strongly Disagree ☐ Neutral ☐ Agree ☐ Strongly Agree

Please explain or share your comments

(Optional)
24. Will you be willing to use the ELEC checklist as a tool to conduct e-learning evaluation?
☐ Strongly Disagree ☐ Neutral ☐ Agree ☐ Strongly disagree
Please explain or share your comments

25. Do you think the ELEC checklist is overall a good framework for e-learning evaluation?
☐ Strongly Disagree ☐ Neutral ☐ Agree ☐ Strongly disagree
Please explain or share your comments

Open-Ended questions

Please provide written comments on the checklist

26. What are the strengths of the checklist?

27. What are the weaknesses of the checklist?
Optional Drawing: Enter to win

THANK YOU FOR PARTICIPATING IN THIS SURVEY.

If you would like to enter a drawing to receive one of the five $50.00 Visa Gift cards, you will need to provide your name, email address, and phone number below and your name will be entered into the drawing. Your name will not be linked to this survey to ensure the confidentiality of your responses.

28. Please enter your name

29. Please enter your email address

30. Please enter your phone number
Appendix G

Human Subjects Institutional Review Board
Letter of Approval
Date: March 18, 2009

To: Gary Miron, Principal Investigator
Anne-Marie Oulai, Student Investigator for dissertation

From: Amy Naugle, Ph.D., Chair

Re: HSIRB Project Number: 09-03-19

This letter will serve as confirmation that your research project entitled “Checklist for Evaluating E-learning in Organizations” has been approved under the exempt category of review by the Human Subjects Institutional Review Board. The conditions and duration of this approval are specified in the Policies of Western Michigan University. You may now begin to implement the research as described in the application.

Please note that you may only conduct this research exactly in the form it was approved. You must seek specific board approval for any changes in this project. You must also seek reapproval if the project extends beyond the termination date noted below. In addition if there are any unanticipated adverse reactions or unanticipated events associated with the conduct of this research, you should immediately suspend the project and contact the Chair of the HSIRB for consultation.

The Board wishes you success in the pursuit of your research goals.

Approval Termination: March 18, 2010