

Building a Tool for Determining E-learning Readiness of Organizations:
A Design and Development Study

Cathy James-Springer

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Katherine S. Cennamo (Chair)

Barbara B. Lockee

Aaron Bond

Jennifer M. Brill

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Blacksburg, Virginia

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ABSTRACT

E-learning continues to gain popularity as a way of delivering instruction in the workplace. However, adoption of e-learning is often considered without determining organizational readiness for e-learning. Comacchio and Scapolan (2004) found that bandwagon pressures such as fear of losing competitive advantage often drive e-learning adoption decisions. Many organizations use various types of analysis to determine instructional need but often at a course level. An e-learning readiness analysis tool will add to existing tools but focus on the workplace organization as the unit of study. The purpose of this design and development study is to create an analysis tool for determining e-learning readiness in organizations. Four existing e-learning readiness models, Aydin and Tasci (2005); Chapnick (2005); Borotis and Poulymenakou (2005) and Psycharis (2005), were used as a basis for identifying factors affecting e-learning readiness which informed the tool design. Using developmental research-based practices the tool was developed for use by practitioners. This study describes the design and development of the tool and the expert review used in the validation of the tool.

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GENERAL AUDIENCE ABSTRACT

In this study e-learning is defined as the use of computer technology to deliver instruction or training using internet or intranet, in synchronous, asynchronous or blended modes of delivery with the objective of improving performance related job skills and knowledge. Use of e-learning for instruction in workplaces continues to grow, but often e-learning is adopted as part of an initiative to remain competitive and not based on prior analysis of the workplace to undertake e-learning. Since e-learning is delivered using technology it presents additional considerations. In this design and development study an e-learning readiness analysis tool was created that would add to existing instructional analysis tools but with specific focus on e-learning. The design and development of the tool is informed by existing literature. This study describes the design and development of the tool and the expert review used in the validation of the tool.

Dedication

I dedicate this document to Irvin and Nya, who were my constant motivation and support.

If you can believe, all things are possible to him who believes. Mark 9:23

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CHAPTER 1

INTRODUCTION AND NEED FOR THE STUDY

Introduction

In 2002 ASTD, estimated that employee access to e-learning would double in two years (Simmons, 2002). Today, of the \$200 billion dollars spent on corporate training, e-learning represents \$56.2 billion, and this was estimated to grow to \$107 billion in 2015 (Docebo, 2014). E-learning can be defined as the use of the internet or intranet for delivery of education or training in a variety of formats. In recent time e-learning has increasingly become a way of facilitating instructional training. The 2013 State of the Industry Report by ASTD, states that technology based methods are increasingly being used and account for one third of learning hours in training. E-learning is often geared at disseminating training in a flexible and convenient way. Training can be facilitated by e-learning in a variety of formats including asynchronous, synchronous, blended, self-paced or instructor guided approaches.

The most common reason for choosing e-learning is reduction in costs associated with getting employees to training sites (Rosenberg, 2001). According to the Docebo (2014) report, the direct training expenditure per employee is reduced with e-learning particularly in organizations with more than 10,000 employees. This is as a result of spending less to reach more. Training can occur simultaneously in more than one location, so savings cost is particularly relevant in companies with geographically dispersed locations (Conkova, 2013). E-learning is perceived to be the secret to ensuring that a company keeps a “competitive edge”. It facilitates delivery of “just in time” training as a means of keeping employees up to date. This anywhere, anytime type of training seems to be another of the major reasons for choosing e-

learning (Rosenberg, 2001). Simply put, organizations use e-learning to remain competitive and save on the cost of training.

However, selection of e-learning for training requires additional analysis, in addition to the ones already done for face to face training. Several types of analysis are usually carried out to determine the needs of organizations, particularly related to employee performance. These skills and attitudes are directly related to barriers learners face in performing their jobs. Instructional tools and material are developed in order to address these skill and attitude deficits (Dick, Carey, & Carey, 2005; Rothwell & Kazanas, 2011). Learner characteristics for e-learning readiness or what can be referred to as technical readiness, are those skills and characteristics associated with computer technology use (Kaur, 2004). The technological resources and organizational climate also have to be included in pre adoption analysis. Borotis and Poulymenakou (2004) suggest e-learning readiness not only represents physical attributes but also psychological within the organization. These considerations are somewhat different from those examined in face to face training and may play an additional role in determining whether e-learning is a suitable vehicle for delivery of training. The proposed new analysis would determine an organization's capacity to use e-learning as a tool for delivery of training. The analysis examines the situation from several perspectives.

Need for the Analysis

Before adopting e-learning it is necessary for organizations to determine their level of readiness, (Borotis & Poulymenakou, 2004; Rosenberg, 2001). This is to say that, organizations need to determine whether they have the capacity to undertake e-learning. E-learning can take place in many settings including Higher Education, but for the purpose of this research the term organization refers to workplace settings. In his article titled Environmental Analysis: A

neglected Stage of Instructional Design, Tessmer (1990), refers to environmental analysis in the context of instructional systems. He suggests this aspect of instructional design is often overlooked. Tessmer (1990) recommends two areas to be considered: the instructional environment and the support factors of the instructional environment. Similarly, Dick et al. (2005) include a learner and context analysis phase in their model. They state that the outcomes of this analysis are directly related to the environment in which the skill will be used and factors that would impede use of the new skill within the organization. Tessmer (1990) states that, though instructional design projects refer to the importance of understanding the environment, environmental analysis is underemphasized. He suggests that environmental analysis should be conducted in the early stages of design projects because it affects design and product stages and decisions which will follow. Farquhar and Surry (1994) used the term “adoption analysis”, which focuses on the context of product implementation. Tessmer (1990) description of environmental analysis includes investigation of the physical environment directly applicable to technology and available facilities, and the support environment relating to management, resources, climate and coordination. Instructional Systems Design (ISD) models and Human Performance Technology (HPT) models bear similar names for their analysis phases but their focus seems to be somewhat different from (Tessmer, 1990).

Many ISD and HPT models include one or more stages of analysis to determine whether instruction is the solution to performance problems within organizations. HPT models begin with performance and causal analysis before determining the intervention. Equivalent to the performance analysis phase in HPT, Harless (1987) suggests the use of front end analysis (FEA) as a way of determining whether performance requires an instructional intervention. Within the performance analysis stage in HPT, an environmental analysis is conducted looking at the

organizational, work and worker environment influencing the performance problem. Though the name is the same, the focus of this analysis is different from Tessmer (1990) environmental analysis. The eventual result of HPT analysis is an intervention selection. Among the interventions, performance support through instruction may be recommended if the performance problem is identified as a lack of skill or knowledge.

Given that a problem arises as a result of lack of skill or knowledge, a training needs analysis becomes necessary. ISD models all use the basic process of Analyze, Design, Develop, Implement and Evaluate (ADDIE) as a framework for design of instruction (Richey, Klein, & Tracey, 2011). This implies that every ISD model uses some form of needs analysis to determine all the details needed to design training that would fill the knowledge or skill gap (Franklin, 2006) but does not consider analysis specific to e-learning. Needs analysis, front end analysis and performance analysis stages are all focused on performance outcomes (Van Tiem, Moseley, & Dessinger, 2000).

The analyses described above have similar names but varied focus. It is important to note however that, within the variation, these analyses have similarities. At some point in the analysis, learner needs, organizational environment and the resources or tools available within the organization are investigated. Tessmer (1990) “environmental analysis” seems to come closest to analysis that can be useful in looking at e-learning spaces. E-learning analysis, would include similar parameters to those outlined in Tessmer (1990) and Farquhar and Surry (1994) with the additional dimension of technology which is incorporated in the context of the instructional system.

What is e-learning readiness?

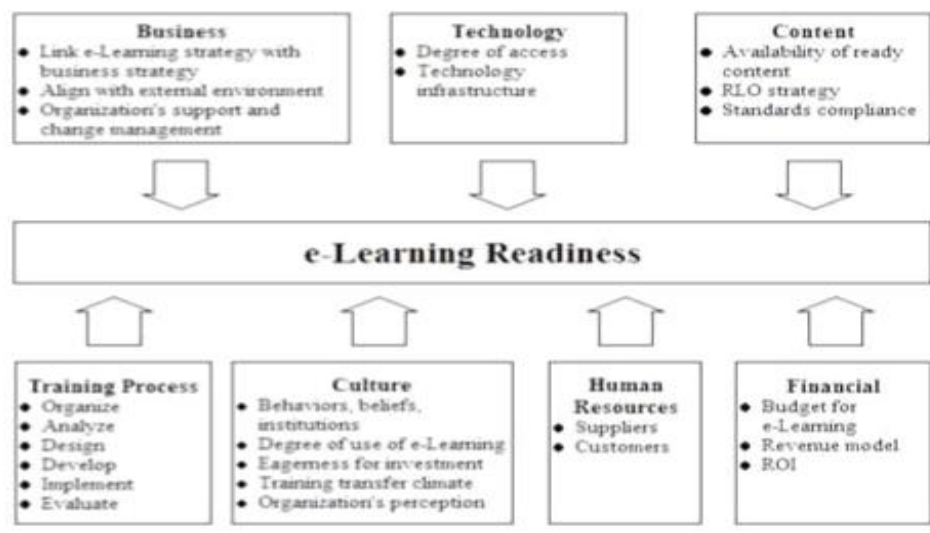
E-learning readiness models present a case for a similar type of analysis to that proposed by Tessmer (1990), with additional questions specific to e-learning. E-learning readiness models (Aydın & Tasci, 2005; Borotis & Poulymenakou, 2004; Chapnick, 2000; Psycharis, 2005) identify individual components needed in order to analyze e-learning readiness. On a cursory glance, the following models show completely different perspectives of what is required for determining e-learning readiness, but closer investigation reveals commonalities that are similar to the analysis stages outlined previously: learner characteristics and competencies; organizational characteristics and attitudes; and resource considerations.

Figure.1. E-learning readiness model from Chapnick (2000)

Psychological Readiness	•The individual's state of mind as it impacts the outcome of the e-learning initiative
Sociological Readiness	•The interpersonal aspects of the environment in which you will implement the program
Technological Skill Readiness	•The observable and measurable technical competencies
Equipment Readiness	•The question of the proper equipment
Content Readiness	•The subject matter and goals of the instruction
Financial Readiness	•The budget size and allocation process
Human Resource Readiness	•The availability and design of the human support
Environmental Readiness	•The large scale forces operating on the stakeholders both within the organization and outside the organization

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Figure. 2. E-learning readiness Model from Borotis & Poulymenakou (2004)



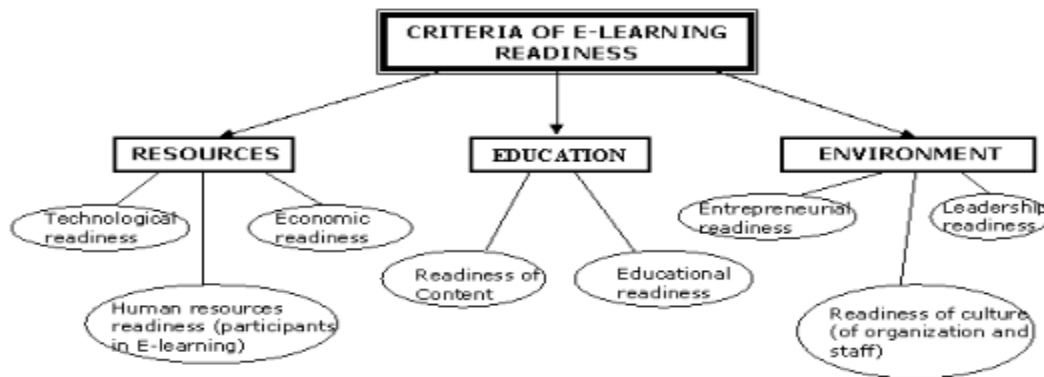
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Figure.3. E-learning Readiness Model Aydin & Tasci (2005)

	Resources	Skills	Attitudes
Technology	Access to computers and internet	Ability to use computers and Internet	Positive attitude toward use of technology
Innovation	Barriers	Ability to adopt innovations	Openness to innovation
People	Average education level of employees Experiences HR specialists. An e-learning champion. Enough vendors and external parties	Ability to learn via/with technology	
Self - development	Budget	Ability to manage time	Belief in self-development

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Figure. 4. E-learning Readiness Model Psycharis (2005)



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Gustafson and Branch (1997) state that models may be simple representations of processes, physical phenomena or ideas. Richey (1986) differentiates between conceptual models and procedural models describing the conceptual models as models consisting of fully defined relevant components. “The conceptual model is more likely to be supported by experience, as well as limited data.” (Richey, 1986, p.17). According to Richey (1986) procedural models bridge the gaps that exist between theory and practice and provide links between variables. Procedural models are usually developed through experience or from another theory. What is missing in the previous conceptual models of e-learning readiness is that they fail to show a systematic process and the relationships that exist among factors. Borotis and Poulymenakou (2004) acknowledge in their conclusions the interrelatedness of components within their model, but they fail to depict the relationships.

Need for the study

Comacchio and Scapolan (2004) identify ambiguity in the reasons for adoption of e-learning and cite adoption literature referencing the “bandwagon” approach. They confirm that bandwagon pressures, such as fears of losing competitive advantage if they do not adopt e-

learning, drive adoption decisions. This supports the premise that e-learning decisions do not necessarily come from front end analysis, but from external environmental pressures. As discussed in the introductory section of this paper, the need to remain competitive seems to be one of the main incentives for e-learning adoption. Lack of e-learning readiness has been associated with problems with e-learning implementation and acceptance (Rosenberg, 2001). Rossett (1992) indicates that one of the main reasons for conducting analysis in human performance is “to model and employ a systematic process for improving human performance” (p.99). If e-learning readiness is viewed from the perspective of the larger organization, and not as a one-time instructional event, then it becomes necessary to develop a systematic way of determining the readiness of organizations for using this training delivery method, which is separate from the types of analyses already used in HPT and ISD. Such a tool can serve both organizations who have already adopted e-learning, to determine where they are in terms of readiness, and companies considering using e-learning.

Purpose Statement

Several conceptual models exist outlining relevant factors for determining e-learning readiness. E-learning readiness analysis is an investigation into an organization’s capacity to support and sustain e-learning, as a means of delivering instructional interventions for remedying performance problems. A tool was developed building on the existing conceptual models. This tool will bridge the gap between theory and practical application of e-learning readiness. The tool offers an alternative analysis to those described in HPT and ISD, one that is specific to determining the current organizational state with reference to e-learning. In this situation e-learning readiness will be looked at as the state of an organization at a particular time. This tool aims to focus on the organization’s broad capability to deliver training and not on the needs of

one course design or instructional event. The tool is intended to be used to determine the capacity of workplace settings to adopt e-learning. The purpose of this study is to build on these models through the design and development of a process tool to analyze e-learning readiness that practitioners can easily apply in real world situations. This design and development was done through a literature review and validation by an expert panel.

Research Question

Through a literature review and validation by a panel of experts this study sort to answer the following questions.

1. What features are necessary for an e-learning readiness assessment tool that is applicable to organizations setting up e-learning programs?

The study is an exploratory design and development research study which follows four of the five phases of the ADDIE process, analysis, design, development and evaluation. Table 1 gives a summary of the goals and data collection methods for each phase.

Summary of data collection procedures

Table 1: Summary of data collection procedures in relation to research questions.

Methodological Phase	Goal of phase	Data collection
Phase 1: Analysis, design and development phase	1. Identify factors relevant to e-learning readiness 2. Identify the features of the tool 3. Determine the sequence of steps to be used in determining e-learning readiness	1. Evaluate e-learning literature to determine factors. 2. Identify the structure and parts of the tool 3. Sequence steps for practical use.
Phase II: Formative evaluation	1. Determine the validity of content 2. Determine practicality of content.	1. Expert Review: Determine the reliability and content validity of content 2. Expert Review: Determine the practicality and effectiveness

Benefits of the Study

This study will add an additional type of analysis to existing analysis methods for instructional interventions of human performance problems. Though conceptual e-learning readiness models exist, they have failed to contextualize e-learning readiness analysis so that it is useful within the human performance analysis and instructional design system analysis processes. It is hoped that the results of this study can serve as a guide for instructional designers when they consider e-learning implementation within organizations.

Organization of the Study

Chapter One serves as an introduction to the study. It provides a background of the reasons for proposing this study through overview of the theoretical underpinnings of the study, a description of the need for the study, the purpose statement, research questions and potential benefits. Chapter Two presents an extensive review of the literature and presents information about existing theoretical constructs of e-learning readiness. The literature review also served as the basis for tool design. Chapter Three details the specific methodology that was be used to conduct the study. This Chapter includes the research design, tool creation methods, formative assessment procedures and survey review instruments, data collection and data analysis. Chapter Four details the stages of the analysis design and development process of the ADDIE model production of the e-learning readiness tool. Chapter Five describes the results from expert reviews and outlines how feedback will be used to modify the tool. Chapter Six discusses findings and describes the implications and relevance of the study.

CHAPTER 2

LITERATURE REVIEW

Introduction

E-learning continues to be an important feature of training within organizations. In order to remain competitive companies adopt e-learning (Chen, 2008; Ozturan & Kutlu, 2010). An organizations' reasons for using e-learning vary. There are several dimensions to successful implementation of e-learning, some of which have been identified from analysis of existing e-learning models. E-learning touches on both the fields of human performance and instructional design since it uses an instructional approach to solve performance problems. Based on preliminary analysis of e-learning models, this literature review will attempt to answer the following questions

1. How are e-learning considerations different from those of face to face training delivery methods?
2. What are the factors that determine e-learning readiness?

Differentiating e-learning as a training delivery method

Defining e-learning

ASTD broadly defines e-learning as a “term covering a wide set of applications and processes, such as web-based learning, computer-based learning, virtual classrooms, and digital collaboration. It includes the delivery of content via Internet, intranet/extranet (LAN/WAN), audio- and videotape, satellite broadcast, interactive TV, CD-ROM, and more” (ASTD, 2014). This definition attempts to cover every application of e-learning. Piskurich and Association (2003) describes e-learning as a “still-evolving discipline” (p.2) and so it is likely that the current definition may change with time.

In the most generic definition of e-learning the “e” represents electronic. Electronic also gives an indication of the format for instructional delivery (Clark & Mayer, 2011). Rosenberg (2001) identifies e-learning as instruction via a computer using internet technology. E-learning is broad, beyond the definitions of online learning. The internet as mediator to learning delivery is not unique to e-learning. Online learning also takes place over the internet or intranet. Online learning is also mediated by computer technology and can be synchronous, asynchronous, blended, hybrid. Online courses can be one format for e-learning, but can have many more. One example, is the use of self-paced activities (Burgess & Russell, 2003) that has a variety of formats. Watkins (2014) gives several examples of e-learning events, seminars, job aids, tutorials and study guides, all being delivered through an intranet or the internet.

The second part of e-learning, the “learning,” determines what is to be included in the e-learning, the content, and the process of helping people learn. Clark and Mayer (2011) describe these two aspects of e-learning as, imparting knowledge (content) and building job related skills (process). Rosenberg (2001) emphasizes the need of include the performance enhancing role of e-learning in any definition of e-learning. Newton and Doonga (2007) refer to the performance aspect of e-learning as e-training. In business organizations e-learning supports performance goals.

The ASTD definition of e-learning includes a variety of media, but Rosenberg (2001) argues against classifying media such as DVD’s and CD-ROM as part of e-learning. He recognizes them as excellent examples of storage media but because they are limited in their capacity for instant updating and sharing he discounts them from being part of an e-learning definition. However, Watkins (2014) equates these media as choices in delivery options.

Variation in media increases flexibility for design and delivery of learning which is unique and suited to each organization.

Any definition of e-learning has to include, the electronic mode of delivery, a link to performance goals and reference to the variety of delivery formats. Performance goals are identified prior to e-learning. The internet or intranet facilitates two way communication between parties using e-learning. Variation of delivery formats promote flexibility in medium and instructional approaches. For the purpose of this research, e-learning is defined as the use of computer technology to deliver instruction or training using internet or intranet, in synchronous, asynchronous or blended modes of delivery with the objective of improving performance related job skills and knowledge.

Concerns unique to e-learning

E-learning is referred to as one in a group of methods which can be used to address performance problems (Watkins, 2014). Utilization of e-learning necessitates addressing differences between face-to-face delivery and e-learning. Learner ideas of what training environments should look like are tied to traditional classroom delivery formats (Cercione, 2008). Since e-learning is delivered by electronic medium this affects the way learners see and approach the medium. Use of e-learning also requires investment in infrastructure to support learning. The infrastructure of e-learning may vary from location to location. These differences are detailed in the following paragraphs.

In a face to face classroom there is no intermediary or medium between instructor and learner. It is a closed space where learners can directly interact with peers and instructor. The main requirement for attendance is knowledge of foundational content. Learning using e-learning affects two main learner concerns, first, the attitudes of learners using computer technology, as a platform for learning may be different from face to face. Second, the absence of skills required to

use e-learning. Kaur (2004) coined the term “technical readiness”. It refers to the skills and competencies that learners demonstrate related to using computer technology”. Schweizer (2004), states that trainers must be aware of the technical skills required by learners for corporate training programs. Understanding technical skills or lack thereof does not only apply to learners but to the entire organization including trainers, administrators, technical and other support staff (Khan, 2005).

Despite progress made with e-learning, detractors still question the soundness of e-learning (Schweizer, 2004), even though media studies have shown no significant differences in learning outcomes between instructional delivery using computer assisted technology and face to face (Lockee, Burton, & Cross, 1999). In e-learning many stakeholders have preconceived ideas about the technology and this may affect decisions to use it. Ideas and cultures within organizations may vary due to differences related to departments and locations. Needle (2010) defines culture as a set of values, beliefs and habits that are collectively shared within an organization. It is possible for there to be multiple cultures within an organization, particularly in larger organizations (Kotter, 2008). Cultural differences can dictate the way learning is delivered and perceived, for example; Hewlett Packard (HP) companies did not adopt e-learning in every overseas branch but chose training delivery methods based on the culture and preference of the learners in the branch (Derouin, Fritzsche, & Salas, 2005). Implementing e-learning may be difficult simply because of the prevailing culture within an organization. Though cultural differences, no doubt, exist in face to face formats, e-learning further exaggerates them.

E-learning requires investment in technological infrastructure. Technological infrastructure encompasses software and hardware. Hardware covers the computers available, the IT infrastructure including current internet/intranet assets, bandwidth and connectivity, the basic

computer systems used and set up. Software includes what is used in day to day transactions within the company, current delivery tools and security set ups. There may also be need for acquisition of infrastructure requiring set up and maintenance. Thought about matters related to computer technology is a necessary part of e-learning.

From the discussions above it is obvious e-learning has specific concerns distinguishing it from face to face delivery. These include stakeholder attitudes, skills and knowledge; required infrastructure for assisting delivery; and the need to overcome cultural differences. These differences help support the need for having a special look at factors related to e-learning readiness.

Factors for e-learning readiness

There are many models referenced in the literature, but not all of them were accessible due to unavailability of website links. Of the e-learning models that were available the Aydın and Tasci (2005) e-learning readiness model is the most cited, (95 times source Google Scholar), followed by Chapnick (2000). Other commonly cited models include Psycharis (2005) and Borotis and Poulymenakou (2004). The main method used in the development of these models was the utilization of existing e-learning readiness models. For this research four e-learning readiness models were used. The e-learning readiness models are not tied to any contextual or educational framework, though they appear to overlap with some areas in IDT and HPT. They are principally conceptual models since they provide categories and factors to use in e- learning readiness analysis.

In the preliminary analysis of the e-learning readiness models some questions emerged related to the factors identified for e-learning readiness. These questions helped identify themes related to e-learning readiness derived from literature. The themes were then used to develop

questions used in the tool. This section presents a brief overview of some of the common e-learning readiness models mentioned in the literature, categorizes the factors for e-learning readiness. These factors were then used in the development of themes used to inform the design phase of this research.

Models for e-learning readiness: Table 2 summarizes how the models categorized the factors they deem necessary to determine e-learning readiness. Each of these models was developed in a different context which may explain the variation in the category labels. After reviewing the models and tools all the factors described can be synthesized into three groups, technology readiness, learner readiness and organizational readiness. A brief summary of each group of factors will be given in the paragraphs to come along with themes related to these factors.

Table 2. Summary of E-learning readiness tools

Aydin & Tasci (2005)	Chapnick (2000)	Borotis and Poulymenakou (2004)	Psycharis (2005)
1. Technology - Access - Learner skills and attitudes 2. Innovation - Barriers - Adoption - Openness 3. People - Employees - HR Specialists - E-learning champion - Vendors and external parties - Skills with respect to learning with technology 4. Self-Development	1. Psychological 2. Technical Readiness 3. Environmental 4. Human resources 5. Sociological 6. Economic 7. Financial 8. Equipment 9. Content	1. Business 2. Technology 3. Content 4. Training process 5. Culture 6. Human Resources 7. Financial	1. Resources - Technology - Financial - Human Resources 2. Education - Content - Educational 3. Environment - Entrepreneurial - Culture - Leadership

- Budget - Time management - Belief in self-development			
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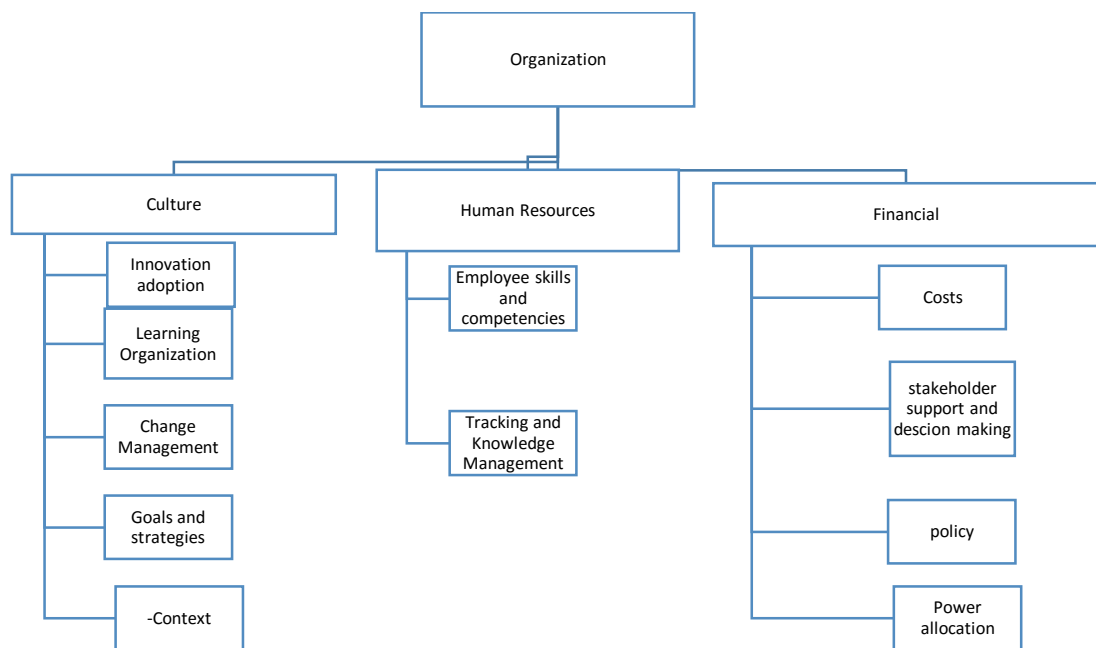
Organizational Readiness: In Table 2, three categories appear several times in the model: culture of the organization, human resource and financial. Other influential factors in e-learning readiness can include politics (Chapnick, 2000), organizational goals and strategies (Omoda-Onyait & Lubega, 2011), and context (Omoda-Onyait & Lubega, 2011; Psycharis, 2005). Psycharis (2005) suggests that e-learning should be built into organizational strategies. Culture, though a difficult word to define, it has implications for adoption of e-learning. A readiness culture refers to staff behavior and attitudes toward e-learning (Psycharis, 2005). Aydın and Tasci (2005), based on Rogers (2003) diffusion of innovation theory, state that companies that are open to innovation tend to seek new ways to improve themselves and the individuals within their organizations.

What is the role of human resources (HR) in e-learning readiness? Since e-learning is linked to performance objectives, HR departments are responsible for the tracking, assessments (determining whether training is effective and being done) and records-keeping associated with training activities. Psycharis (2005) suggests that people involved in the adoption process should be knowledgeable about e-learning. Since e-learning involves more than just learners other people involved must have the necessary skill and experience for delivery and maintenance of the system.

E-learning is a business decision. Reduction in training costs is cited as one of the most compelling reasons for e-learning adoption (Aydın & Tasci, 2005). Financial readiness has three facets: who holds the power, the company policy with reference to e-learning, and stakeholder

support. How is e-learning going to be financed? Chapnick (2000) states that initially identifying who holds that power within an organization can determine how the e-learning initiative will move forward. Knowing company policy on how budgets are allocated and possible competitors for the e-learning budget all impact readiness (Chapnick, 2000). Stakeholder involvement ensures people important to the process are kept abreast with every stage of the e-learning investments, allowing them to understand the benefits of e-learning (Chute, Hancock, & Thompson, 1999). The cost factors associated with e-learning can be a deciding factor in implementation. Figure 5 below summarizes the categories related to organizational readiness.

Figure 5: Factors of Organizational Readiness from the models



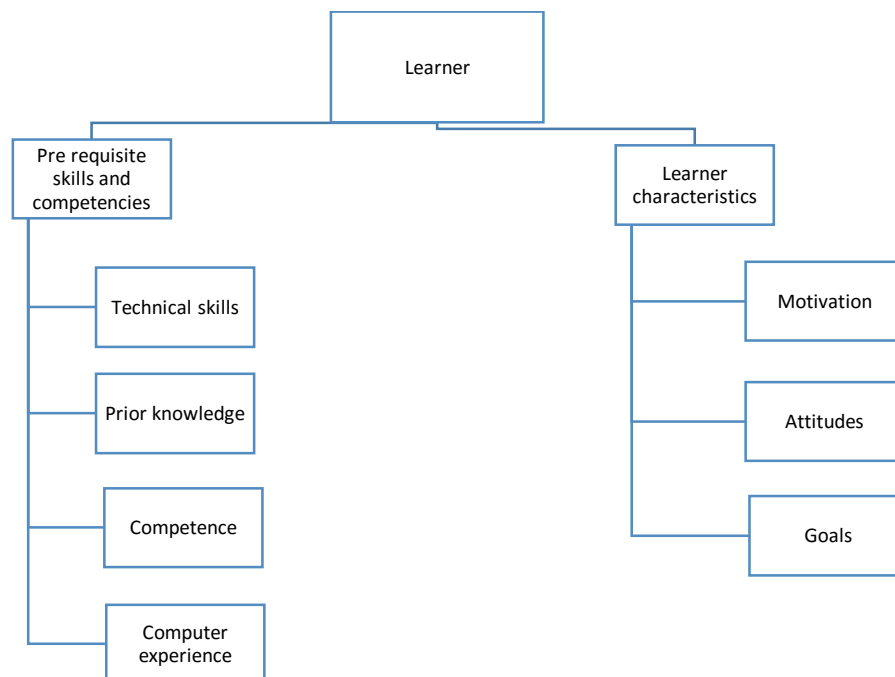
Learner Readiness: Employees should be at the center of e-learning initiatives (Haney, 2002). As e-learning can take several forms; blended, instructor taught and self-paced. These choices will appeal to a different types of learner. Employees may be expected to participate in

activities requiring independent learning, depending on the structure and expectations of the training. Aydın and Tasci (2005) categorize these as self-development issues. Learners' interest, personal goals and attitudes, learning preferences, and motivation are examples from the twenty aspects of learner characteristics that Khan (2005) identifies as relevant to e-learning.

Aydın and Tasci (2005) mention learner skills and attitudes in relation to technology. Learners' intention for using e-learning is influenced by three things: learner characteristics, technical abilities, and attitudes toward learning and technology. Spiros Borotis and Poulymenakou (2004); Psycharis (2005) and Chapnick (2000) identify technical skills as one of the factors affecting e-learning readiness. In ID and HPT, prior knowledge and pre-requisite skills for specific courses are assessed through learner analysis. E-learning analysis should include technical skills and prior experience with a computer.

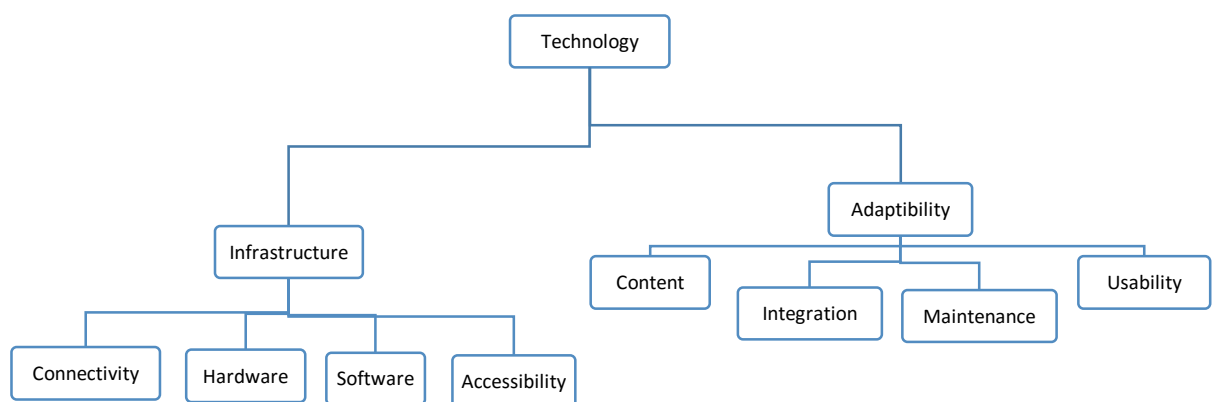
The Figure 6 below summarizes the categories related to learner readiness.

Figure 6. Factors of Learner readiness developed from the models



Technological readiness: Table 2 shows that technology is identified in all the models as a readiness concern. Technology accounts for infrastructure. Each model mentions infrastructure whether referring to software or hardware. Beyond this, there are divergent views on how to classify other categories of technology. Chapnick (2000) uses the term equipment readiness to look at the equipment that learners can interact directly with. Psycharis (2005) places technology into broad heading of resources and includes concepts such as connectivity and accessibility. Psycharis (2005) refers to the appropriateness of technology to the content and the learner. This is a unique categorization as it not only looks at technology as equipment but makes the connection between technology, learning and content design. Aydın and Tasci (2005) list employee technological skills and attitudes toward under technology. From the way that the models consider technology, the following categories emerged as e-learning readiness factors.

Figure 7: E-learning readiness factors for Technology readiness from models



Themes for e-learning readiness

The questions derived from the e-learning readiness models were used to develop themes used for developing questions in the tool. These questions are discussed in their relevant sections however, Table 3 provides a summary of questions emerging from the model analysis.

Table 3. Questions emerging from the literature review

Readiness Factor	Question
Organization	What are the characteristics of a good learning organization? What are the characteristics of an innovative organization? What are the qualities of the people involved in the e-learning adoption process? What are the financial considerations for establishing e-learning?
Learner	What are the characteristics of a good e-learner? What are the minimum technological skills and competencies for e-learner?
Technology	What is the minimum requirement for computer technology adoption of e-learning? What are the features of e-learning that accommodate adaptability?

Organizational Readiness

What are the characteristics of a learning organization? Why think about a learning organization? Psycharis (2005) defines a learning organization as “an environment where experimenting with new approaches is encouraged and mistakes are not considered a failure” (p. 6). The idea of an organization which encourages experimentation merited further examination since, the definition given by Psycharis (2005) gave little understanding of what a learning organization entails. Further research on the term revealed that organizational learning and learning organization are often used interchangeably in organizational learning literature (Örtenblad, 2001). In the book *The Fifth Discipline: the Art and Practice of the learning organization*, Peter Senge gives a description of the learning organization which should have differentiated between a learning organization and organizational learning but this was not the case. Senge (1990) discusses the five disciplines of a learning organization. These include systems thinking, personal mastery, mental models, building vision and team learning.

The Senge (1990) framework appears idealistic, an opinion shared by Garvin, Edmondson, and Gino (2008). Regardless of the idealistic nature of the “learning organization” Garvin, Edmondson, and Gino (2008) build on Senge (1990) framework by simplifying the concepts into three building blocks which are: a supportive learning environment; concrete learning processes and practices; and leadership that reinforces learning. Their simplified building blocks makes the idea of a learning organization easier to understand and apply.

The first building block represents an environment where learning is valued and everyone is part of the process. Everyone’s input is valued (Nonaka & Takeuchi, 1995). The second building block describes an organization where learning activities have a deliberate process and plan. These processes influence how learning initiatives are managed. Garvin et al. (2008) see education and training as an accepted part of learning organizations. Through the process of training employees adequately and updating training, the concept of training becomes commonplace and not necessarily only when new skills are required. This means that training is continuous. The third block explains leadership support that helps provide opportunity to use and apply learning. These three building blocks can serve as support structures integrating learning into the normal work environment. These building blocks show that emphasis does not necessarily have to be on attaining the ideal “learning organization”. An organization that values and enables learning can be sufficient.

Can an organization learn? Or does knowledge and learning rest exclusively on individuals within an organization? Argyris and Schon (1996) describe organizational learning as an individual’s inquiry into a problem on the organization’s behalf. The solution eventually becomes part of the organizational artifacts in order for it to become organizational learning. Newer definitions of organizational learning have slanted toward the idea that knowledge is

social (Brown, Collins, & Duguid, 1989; Lave & Wenger, 1991) rather than individual. Nonaka and Takeuchi (1995) acknowledged that new knowledge begins with the individual. It through sharing and dialogue or discussion with team members that individual knowledge becomes organizational knowledge.

Knowledge generation can have several avenues, since organizations provide opportunities for generation of knowledge through interaction between people, established routines and symbols (Blackler, 1985). It is obvious that learning has to start with individuals. This can only occur if the organization provides processes to encourage shared experiences and memories. These experiences eventually become part of the structures and strategies within the organization, the culture of the organization. The movement of knowledge from individual to organization can be advantageous since shared experiences ensure that knowledge remains even after employees have left.

Applicability of the organizational learning ideas to e-learning. Can organizational learning concepts be applied to e-learning? Rosenberg (2007) coins the term “smart enterprise”. It is a concept similar to the learning organization but with the additional focus on the role of technology.

A smart enterprise is a high performing organization that allows knowledge and capabilities, enabled by technology, to grow and flow freely across departmental, geographical, or hierarchical boundaries, where it is shared and made actionable for the use and benefit of all (Rosenberg 2007, pp.39).

In his description of smart enterprise Rosenberg emphasizes five key points: a focus on knowledge and application; the effective use of technology; a systematic and dynamic approach; emphasis on both individual and team; a performance foundation. Rosenberg (2007)

acknowledges that smart enterprise draws its' foundation from the learning organization. It marries learning organization principles with technological principles.

An organization adopting e-learning should value learning and incorporate technology in a systematic and deliberate way. Between the organizational learning literature and Rosenberg's smart enterprise, several themes emerged that will be useful in searching e-learning literature. These are listed in Table 4 below.

Table 4. Themes from organizational learning questions

Theme	Description
Learning as a culture	Cultural Norms, structures and strategies that help in valuing learning
Supportive learning environment	Leadership support, resources,
Learning processes	Process used to facilitate learning
Performance goals	Performance problems and processes to address them
Knowledge management	Understanding where knowledge exists at any time in the organization.
Effective use of technology	Use of technology for learning and other day to day activities.

What are the characteristics of an innovative organization? When e-learning emerged, like many technological tools in education it was it was hailed as a technological innovation that would change education. E-learning did bring about changes and continues to evolve just enough to remain a novel approach to instructional delivery. It began with desk top computers but is now being used on mobile devices in places never before anticipated. This ever changing characteristic of e-learning means that the adoption parameters for e-learning need to continuously change. This prompted the decision to include an aspect of innovation adoption in

the e-learning readiness literature review since, the innovativeness of an organization is readily linked to its culture (Aydın & Tasci, 2005).

Rogers (2003) outlines the relationship between structural characteristics of an organization and innovativeness. He recognizes that there are several variables within an organization that may affect innovation adoption. These are individual leader characteristics, organizational structure, and external characteristic of an organization or the level of openness. Organizational structure is further broken down into degree of centralization, complexity, formalization, interconnectedness and organizational slack, which are explained in the Table 5.

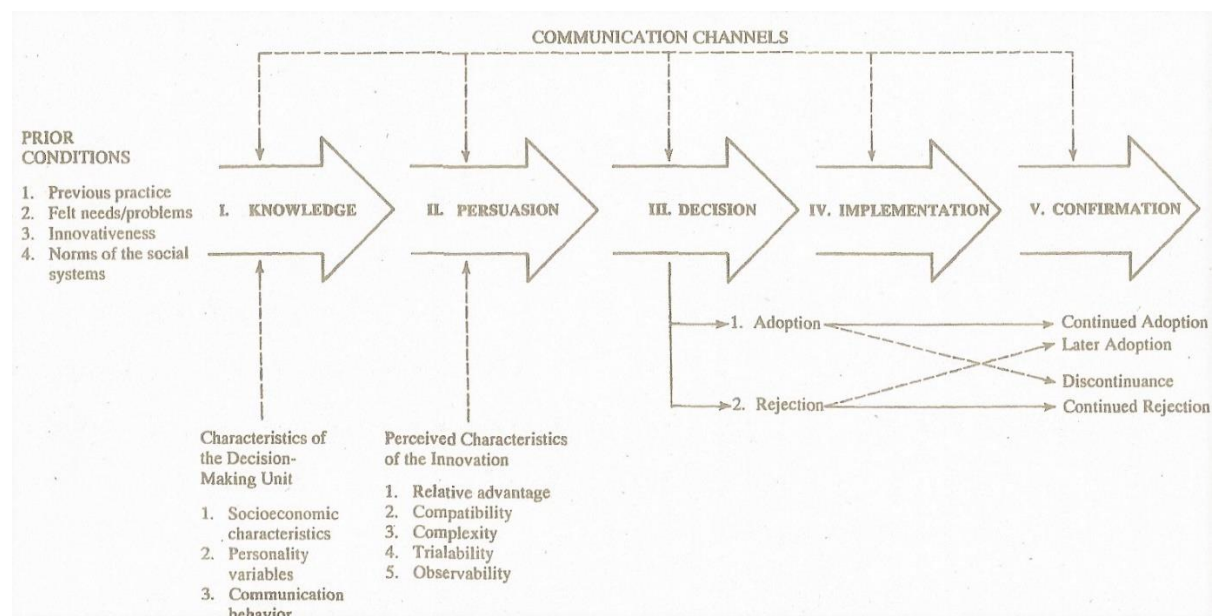
Table 5. Rogers (2003) organizational structure internal characteristics

Internal Characteristic	Meaning
Centralization	The degree to which power and control in a system are concentrated in the hands of relatively few individuals
Complexity	The degree to which an organization's members possess a relatively high level of knowledge and expertise, usually measured by the member's range of occupational specialties and their degree of professionalism (expressed by formal training)
Formalization	The degree to which an organization emphasizes members follow the rules and procedures
Interconnectedness	The degree with which the units in a social system are linked to interpersonal networks.
Organizational slack	The degree to which uncommitted resources are available to an organization.

Notably, Roger (2003) refers not to leadership support as seen in the organizational learning literature but the actual attributes of the leaders within an organization which includes leader attitudes. Roger indicates that the influence of these variables may change between adoption and implementation. For example, low centralization, high complexity, and low formalization facilitate beginning the innovation process but may be detrimental to implementation.

One of the shortfalls recognized by Rogers (2003) is the lack of research on what happens after implementation of communication innovations regarding adoption. He provides a useful structure for the innovation process in organizations which show a direct relationship between organizational goals and the innovation adoption. It also shows the progression at which the innovation eventually fits the needs and use of the organization. Figure 8 shows how an innovation can become integrated into an organization and eventually be redefined to suit the organization and become a part of the organizations routines. This Figure 8 combines the reason and need to consider both implementation and adoption factors.

Figure 8. Five Stages of Innovation Process in Organizations



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This progression in Figure 8 shows how an innovation can eventually become part of the routines and practices of the organization. These five stages are analogous to the computational learning theory where individual learners subsume new information and reformat to meet their

preexisting knowledge. Rogers's (2003) ideas about adoption and implementation are general frameworks that are assumed to be applicable to any innovation. The process outlined in which an innovation evolves to eventually become a part of the organization, can easily apply to e-learning.

As e-learning is considered a technological innovation in this research, it would be useful to review Ely's eight conditions for implementing technological change. Ely (1990) presents eight conditions for implementing technological change, these were useful in considering possible barriers to implementation. These are described in the Table 6.

Table 6: Ely (1990) Eight conditions of technology implementation applied to e-learning

Condition	Definition of meaning (Ely, 1990)	Possible application to Organizations/ e-learning
1. Dissatisfaction with the Status Quo	Dissatisfaction with the current conditions	E-learning is adopted out of the need to remain competitive
2. Knowledge and skills exist	People involved in the implementation have the necessary skill to implement and foster the change	People involved in e-learning must have the necessary knowledge and skills to accommodate adoption.
3. Resources are available	Resources needed for innovation must be easily accessible (Focus mainly on hardware & Software)- refers mainly to physical resources	Both physical and human resources should be available for e-learning.
4. Time is available	Time is necessary to "learn, adapt, integrate and reflect on what they are doing"- Only refers to the implementers	People involved in e-learning must be given time to understand how e-learning works and how it affects the organization.
5. Rewards or incentives exist for participants	Incentives for change	Incentives for changing must be present.
6. Participation is expected and encouraged	Shared decision making and communication	Implementation should include different departments in order

Condition	Definition of meaning (Ely, 1990)	Possible application to Organizations/ e-learning
	between the people who the change is going to affect.	to keep people informed. This results in harmonized integrated decision making.
7. Commitment by those involved	Commitment to the innovation occurs at all levels.	Commitment can be financial or participatory support.
8. Leadership is evident	There are two levels of leadership. The executive officer of the organization and the project leader	Leadership support is evident

Though, Ely's research is primarily in higher education some of the concepts may be applicable to organizational settings. It may be possible to adapt or at least consider some of the features of Ely (1990)'s conditions as factors in e-learning implementation. Table 6 above examines Ely's conditions and proposes that these can apply to e-learning in organizations.

Rogers (2003) and Ely (1990) share several ideas that could be used to answer the question: "What are the characteristics of an innovative organization? By looking at the characteristics of the organization in relation to innovativeness, the steps for implementation (Rogers, 2003) and the conditions under which innovations need to take place (Ely, 1990), it was concluded that not only are the characteristics of the organization worth exploring but also what systems are in place to support implementation. Table 7 below captures the themes which emerged from Rogers (2003) and Ely (1990).

Table 7. Themes developed from innovation literature

Themes	Descriptions
Leader Attributes and support	This includes attitudes and skills that the leader may possess. This also influences support
Organizational Goals	Rogers (2001) implementation process briefly deals with the organizational agenda. This is part of Ely's first condition.
Rewards and incentives	Ely's focus is on the implementers but rewards and incentives also apply to adopters
Systematic Process	Commitment and planning is necessary of adoption
Knowledge and skills for implementation	People implementing should have the necessary skill and knowledge about e-learning.
Support structures (Resources)	Resources may be physical, personnel, and financial
Communication	It is necessary for people to be aware of the change. This is a way of helping people accept it.

What are the financial considerations for establishing e-learning? E-learning falls under general training budgets in many organizations (Roffe, 2002). Measuring the value of training is generally difficult since the results of training are not always obvious or tangible. One of the most mentioned benefits of e-learning is the saving achieved through reduced travel costs for learners and instructors, but yet there is difficulty in measuring these benefits against the other expenses that accompany e-learning. Although, Kirkpatrick's model is well established as a way of measuring progress in traditional training only levels one and two have been shown to be practically applied (Deeny, 2003; Fister, 2002). Level one measures participants reactions to training and level two determines what was learned (Kirkpatrick, 2005). Measuring e-learning returns shares these difficulties. This section will look at the areas that have financial

implications for an e-learning project and the role of assessment and evaluation in determining success.

One of the main challenges with measuring and assessing the impact of e-learning is the inability to define terms, such as effectiveness and success. Fayyoubi and Monteroni (2009) state that the e-learning effectiveness measures should be defined and linked to objectives. Galloway (2005) states that effectiveness must be evaluated at the individual and organizational level. Kirkpatrick/Phillips model (KPM) has several levels for evaluating training. It begins with the learner levels and moves toward the organizational impact of learning. Galloway (2005) proposes an adaptation of KPM that is related to the peculiarities of e-learning. He argues that KPM was developed for traditional learning environments and so adjustments are necessary.

Level five, ROI introduced by Phillips (1996), is difficult to apply because it is hard to isolate factors related to e-learning. Level five can be calculated in one of three ways: cost per students as appears in the state of the industry reports (Miller, 2013), administrative costs of the new program compared to that of the previous program, and assigning a monetary value to the benefits and using this against the cost (Deeny, 2003).

Calculation benefits involves two perspectives the Return on Investment (ROI) and the Return on Expectations (ROE), the “hard” and “soft” benefits respectively (Deeny, 2003). ROI represents processes that can be easily calculated such as explicit costs like reduction in hotel costs and instructor time. ROE is harder to calculate since it involves trying to determine transfer of knowledge and how it has improved skills such as customer service, the “softer” benefits of e-learning. There are three main types of expenses according to (Sharma, 2011): distribution, staffing, and support expenses. Although Sharma (2001) describes a higher education setting, these expense areas can be applied to other organizations using e-learning.

In the past, e-learning initiatives involved massive investments in infrastructure with little consideration for the goal or purpose of the training, and in many instances this resulted in “failure” of e-learning (Adams & Morgan, 2007; Rosenberg, 2007). Ideas about what should come first is rapidly changing with the initial focus being on resources, followed by technology (Adams & Morgan, 2007). Bahlis, Eng, and Tourville (2004) outline a four step plan for analyzing how training budgets should be allocated. Part of this plan is a cost/ benefit analysis followed by a selection of the most cost effective method. This approach ties any expenditure for technology to a particular training goal.

Infrastructure includes both hardware and software. If training is to take place at the workplace, expenses include the hardware such as additional computers designated for e-learning, and upgrading the network to undertake e-learning. One of the main hindrances to e-learning adoption in small businesses was the limitation of budget for investment in infrastructure (Admiraal & Lockhorst, 2009). This is especially true if there is initial investment in a Learning Management System (LMS) system. Additional, but often overlooked, is the cost associated with repair and maintenance of equipment (Sharma, 2011). There are many vendors for e-learning and possible integration with existing infrastructure may be necessary. For example, will an LMS be compatible with the already existing technology used within the organization? It may need to integrate with HR systems and work on the existing infrastructure. If the systems are not compatible, additional costs may be incurred to customize them (Rosenberg, 2001). Equipment costs can be distributed across more than one training program (Sharma, 2011). One pertinent question is how the infrastructural expenses associated with e-learning will be separated from other computer related expenses.

As with expenses related to computer technology, separation of expenses allocated exclusively to e-learning personnel is difficult. E-learning requires dedicated staff both in the implementation and the adoption phases. Staffing decisions are based on whether development is going to be done in house or externally. Internal development, would require the services of the design and delivery personnel and support staff, but facilitate more customized products. If the necessary skills are not available in house, then hiring of new staff produces an additional expenditure. Consultancy expenses may be beneficial by avoiding errors associated with novices (Bahlis et al., 2004). All projects incur administrative costs. Administrative expenses may vary depending on the scope and time period of the e-learning project. Sharma (2011) states that often in higher education projects, there is underestimation of the number of people involved in the project and also whether the cost changes depending on the scope of the project. Expense decisions require weighing the costs and benefits.

Learning support requires policies and incentives (Khan, 2005). E-learning by its nature requires support systems. One of the necessities for change is open communication and dissemination of information. This involves marketing offerings (Welsh, Wanberg, Brown, & Simmering, 2003). Employees need to know what is being offered in order to use it. While the need for internal motivation of adult learners is recognized, several types of incentives on the part of the organization is also needed as a motivator. Incentives may be in the form of promotions, monetary rewards, initiatives paid for by the organization and time to access e-learning. Moshinskie (2003) suggests including rewards, both monetary and non-monetary. Examples include, increased pay, time off with pay, improved work conditions, promotions and certification. All of these initiatives need to be considered as part of the costs of an initiative. These support systems may require some policy changes.

Whether the Kirkpatrick/Philips Model or some other method is used to determine effectiveness of e-learning, an assessment and evaluation plan is necessary. It would help determine from a financial standpoint whether e-learning is meeting expectations or goals. Table 8. shows the themes found in the literature which would apply to the financial aspects of e-learning.

Table 8. Themes developed on financial requirements

Theme	Descriptions
Costs	Identify areas of costs including infrastructure and personnel, outsourced , maintenance and integration
Savings	Identify areas where savings occurred
Marketing and communication Strategies	The marketing strategies used and whether they had additional costs.
Incentives	Identify the types of incentives that are given and whether they had additional costs.
Policy	The policies in place to encourage e-learning that involve finance
Evaluation and Assessment	Evaluation and assessment procedures used

Human Resources

What are the qualities of the people involved in the e-learning adoption process?

Initially this question was aimed at determining the role of people who were involved in the implementation of e-learning, but as the literature review continued, it became very apparent that the role of Human Resources (HR) was much wider than originally anticipated. The “people” involved in e-learning is divided into two groups: the learner who is the eventual user of the system, and the group who is going to be involved in the implementation and sustenance of the e-learning project. Both groups require knowledge, skills and competencies that may have an effect on the e-learning adoption. This section is mainly focused on the concerns of

implementers and people involved in the adoption process. Since learners present their own unique challenges in e-learning readiness and will be discussed later. Previously, through Ely's work, we described some of the expected characteristics of implementers.

In Ely's framework for technology implementation in higher education, he refers to the implementers in four of his conditions; No 2. Knowledge and skills exist; No.3. Resources are available; No. 4. Time is available; and No. 6 Participation is expected and encouraged (see Table 6). Based on this, there is need to determine the skills and knowledge of the people who are going to be working toward adopting e-learning. Key among them is the IT department. Who are the people involved in implementation? An implementer can come from any part of the organization or even be outsourced. However, in order to get the full picture of what is needed, adoption committees need to involve representatives from everyone who is going to be affected by the initiative. Hall (2002) states that partnering with various departments helps understand the challenges of each department. This is useful in two ways. Firstly general involvement ensures that the needs of everyone are considered. It encourages a variety of perspectives. Secondly, it is an opportunity for building knowledge and capacity about e-learning, thus creating champions for e-learning. This produces a measure of awareness within the organization. A champion is defined as someone who has knowledge of the initiative and is willing to move it forward (Rosenberg, 2001). The champions can come from various levels within the organization, enthusiastic leaders who support e-learning, enthusiastic managers and enthusiastic users who go on to tell positive stories of e-learning.

In condition No.3 Ely (1990) refers to resources, but his focus is on physical resources. It is suggested that people within the organization are useful resources for e-learning since they bring experience, knowledge and skills that support the process. Though Ely focuses on

implementation, two phases are required, implementation and adoption, meaning that personnel are necessary in both phases. It can be concluded therefore, that an audit of current and desired competence, skills and knowledge is required. This is particularly important for instances where the organization is weighing internal development against outsourcing. In house, design and development would include determining whether the necessary staff, such as instructional designers, subject matter experts, and production team members such as graphic designers, instructors and project managers, are available in the initial stages. In the later stages, support staff including the IT department, will be involved. The role of IT staff deserves special mention since after implementation they remain with the responsibility of supporting and maintaining e-learning.

Schreurs et al. (2008) state that human resource readiness has two facets: the human support system and the ensuring that the necessary pre-requisite skills exist for learning in the new environment. HR departments are responsible for the tracking, assessments (determining whether training is effective and being done) and record keeping associated with training activities (Barrow, 2003). This is a key role of knowledge management (KM). Keeping track of knowledge is often the role of the Human Resources (HR) department and knowledge management is often a part of learning strategies. HR is the entry point for information since they are responsible for hiring staff. They are aware of the entry skills of employees and should be the point of continued tracking of employees achievements.

Knowledge management (KM) is defined as the “creation, archiving, and sharing of valued information, expertise, and insight within and across communities of people and organizations with similar interests and needs” (Rosenberg, 2001, p. 66). KM if used efficiently can be part of the process of making individual knowledge part of organizational knowledge.

Individuals often possess the knowledge but may have difficulty expressing it. This is termed tacit knowledge. Tacit knowledge is developed through experience (Polyani, 2003). For example, through using a printer, a worker may be able to trouble shoot and make it work without a manual yet, if asked to explain how it is done, they may have difficulty expressing how to do it and even when the information is shared, another user may have different results. Explicit knowledge can easily be explained (Polyani, 2003). When the individual tacit knowledge can be converted to explicit knowledge and shared, it then becomes organizational knowledge. In Nonaka and Takeuchi (1995), creation of knowledge appeared in all levels of the organization, from front line workers to management. They describe knowledge creation as holistic, a union of mind and body. Sources of knowledge exist throughout the organization and awareness of them, and an understanding of the cultural aspects needed to help disseminate knowledge can go a long way toward achieving a competitive organization. Technology has changed the role of KM from the traditional role of document storage to a more central role in the formal and informal learning processes within an organization by facilitating knowledge sharing.

This section began with the question: What are the qualities of the people involved in the e-learning adoption process? While the qualities of people are important, for example, there is a need to know what knowledge, skills and attitudes are present, from this review it was discovered that the role of HR in e-learning is much wider than initially thought. HR needs to know what personnel exist, and are needed, in addition to their knowledge and competence related to e-learning. The HR role is important both in the implementation and adoption stages. KM plays a particularly crucial role in this, since it can determine what skills are present and use this information to plan for the future. It can help identify gaps. Knowledge sharing in this

environment helps since it is likely that employees are most aware of their learning needs. HR also needs to have the foresight to anticipate what skills and competence will be needed in an e-learning project. Table 9 below describes the themes which emerged from exploring the human resource concerns in e-learning.

Table 9. Themes developed related to human resources

Theme	Descriptions
Implementers	• Audit of the people who will be affected by e-learning both in implementation and after adoption. • Determine who will be involved in each stage • Level of input in decision making processes
Existing Staff	• Skills, attitudes and knowledge with respect to e-learning • Current positions and job descriptions that can be used for e-learning
Future Staff	• Skills and knowledge that will be needed in the future
Knowledge management	• Knowledge that exists in the organization, this includes documentation, policy strategic plans and goals • Knowledge sharing, dissemination of knowledge within the organization

Learner readiness

Instructional design models include an analysis phase aimed especially at determining the characteristic of learners, for example, Dick et al. (2005) has a stage called “identify entry behaviors”. This is a learner context analysis aimed at finding out general learner characteristics such as skills, attitudes, demographics and experience. Their analysis also seeks to determine prior knowledge and motivation in advance of course design. A learner analysis for e-learning would need to be broader but would have similar objectives to those conducted for course design. Learners in organizations have profiles shaped by their experiences, ages and responsibilities both in the organization and outside of it (Cerccone, 2008). Understanding these characteristics can help influence choices for e-learning design. The following discussion begins

by trying to determine how to define the features of organizational learners, and the characteristics of these learners then relates these characteristics to an e-learning context.

What are the characteristics of a good e-learner? In organizational settings, variations in skills and knowledge occur, particularly in organizations that have many levels and departments. Organizational learners also have varied levels of personal responsibility and time. Some of the characteristics of learners are similar to those described in adult learning theories. What characteristics make adults unique? Adult learning theory, andragogy, developed by Knowles, Holton, and Swanson (1998) outlines the characteristics of adult learners as having a self- concept, adult learner experience, readiness to learn, orientation to learn, and motivation to learn. Andragogy distinguishes between adult and childhood learning (Cercone, 2008). The meanings of these characteristics are outlined in Table 10 below.

Table 10. Characteristics of adult learners

Characteristic	Description
The need to know	Adults need to know why they are learning something before doing so
The learner's self-concept	Adults have developed a self-concept and learning should facilitate self-directed learners
The role of learner experience	Adult education should seek to incorporate learner experience
Readiness to learn	Learning is perceived as something that prepares them for real life situations and applications.
Orientation to learning	Adults "learn new knowledge, understandings, skills, values, and attitudes most effectively when they are presented in the context of application to real life situations." (p. 59, Knowles et. al, 1998)
Motivation	Motivations are external and internal.

Knowles (1978) theory lays no specific context for application. Each learner is unique, and is shaped by his/her background and environment (Cercone, 2008). However, learning in organizations is more effective if learners can see the relevance of what is being learned and can

relate the content to their jobs (Derouin et al., 2005). Knowles (1998), through his anagogical process model for HRD, highlights the learner role in an environment that encourages learning through a process of mutual planning and determining learner needs. All the characteristics presented in the adult learning theory are useful in shaping on-the-job learning and how it can be valuable to learners.

Waight and Stewart (2005) present a conceptual model which incorporates the ideas of adult learning and e-learning within the corporate environment. They indicate that a major part of getting positive learning outcomes is to do the necessary ground work through several types of analysis in order to gather information that would help in understanding adult needs. They comment that “overall the transfer of andragogy to e-learning is the act of understanding the theory and creatively applying its meaning in practical ways.” (p. 341). In an area with little research, this model provides a suitable bridge between how adult learning theory can influence e-learning design and how it can be applied to corporate settings.

Dabbagh (2007) working in a higher education context, lists several characteristics which overlap with adult learning theory but are critical for the success of an online learner. Many of the characteristics described are similar to those of adult learning theory. These include having academic strong self-concept, possessing an internal locus of control, and exhibiting self-directed skills. The ability to be self-directed in an online environment is useful, since it leads to good time management and organizational skills. Since adults are primarily in control of other aspects of their lives, control in learning environments can be motivating.

Using both the characteristics of online learners in Dabbagh (2007) and of adult learners in Knowles (1978) the themes that were determined to be useful are outlined in Table 11.

Table 11. Themes developed for learner characteristics

Themes	Description
Self-directed/ self-concept	The self-perception of the learner, how they perceive their abilities and skills
Application	Learners need to see the relevance of what is being learnt
Involvement/	Role in making decisions about their learning. (decision making power in their learning choices)
Motivation	Factors influencing motivation
Time management	Work life balance

What are the minimum technical skills and competencies for an e-learner? A

judgment of competence varies from context to context and is usually related to an expected performance (Gilbert, 1978). Expectations of competence are very relevant in e-learning, especially since work force training involves employee who are older and has very little experience using technology (Becker, Newton, & Sawang, 2013). Prensky (2001) coined the terms “digital natives”, to refer to people who are born into the digital age as compared to “digital immigrants” who were born before the digital age but have adapted to the environment. This distinction may well apply in e-learning since Becker et al. (2013) found that older workers are more likely to have difficulty transitioning to the new learning format.

There is a need for learners to have “technical readiness” in order to use computer technology (Aydın & Tasci, 2005). However this term, technical readiness, is ill defined. Dabbagh (2007) identifies exhibiting fluency in use of online technologies as one of the characteristics of a good online learner. This is a useful way of describing technical readiness but fails to define what fluency would look like. Guglielmino and Guglielmino (2003) divide technical readiness into four components, knowledge, attitude, skills and habits (KASH) with

each component having a unique aspect of technical readiness. The full explanation for KASH is presented in Table 12.below.

Table 12. A breakdown of KASH technical readiness components.

Technical readiness components of KASH	Description
Technical knowledge (K)	• Technical knowledge needed for e-learning this includes basic knowledge of components and operations of the technical system being used to deliver e-learning. • Awareness of resources for technical assistance
Technical attitudes (A)	• Positive feelings about the use of technology as a delivery system • Learners' confidence in their ability to manage the basic technology involved • Positive expectations for mastering new technical challenges
Technical Skills (S)	• Competent application of basic skills needed in order to use the technical system used to deliver e-learning
Technical habits	• Varies with technology • Ensure habits leading to appropriate participation, submission of work and saving of work

These attributes are simplifications of some of the adult learning theory concepts and directly address learner issues unique to e-learning. KASH is focused more on the learner than on the technology and this is a useful way to approach learner characteristics since technology is constantly changing. The concepts can remain the same, but the type of e-learning can change the expectations from using KASH. For example, technical habits in a self- paced module may differ from those in an online tutor led training course.

There are so many variations in contexts and learner situations that it is difficult to point to what is advantageous. For example, Rosenberg (2008) gives an example of e-learning which was delivered as a single question every morning to supermarket workers. The simpler the e-learning solution the less technical skill is needed. Piskurich (2004) implies that people with the “requisite knowledge, attitudes, skills and habits in technology” will be more successful at e-learning. For example, e-learning readiness tools such as the one used in Floyd (2003) for the ACME program asked a question:

What operating system do you use?

- Windows 95
- Windows 98
- Windows 2000
- Macintosh
- UNIX
- Other

Presently many people do not use some of these operating systems. The skills required to use them would also be different from those needed for today’s operating systems.

Nowhere in the literature is a minimum skills requirement expressly stated for e-learning. It is more worthwhile to focus less on the specific skills but more on the attributes that learners bring such as a positive attitude to change. The degree of technical readiness cannot always be pre-determined. Table 13 shows the themes derived from this question.

Table 13. Themes developed for technical competency

Themes	Description
Prior experiences	The influence of prior experiences on the possibility of adopting e-learning.
Prerequisite skills and knowledge	• The skills that learners have which will assist in success in an e-learning environment • Skills and knowledge about technology
Learner attitudes	• The influence of learner attitudes about learning. • The influence of attitudes about using technology for learning
Learner Habits	• Habits of learners in relation to technology

Technology Readiness

Technology readiness is the term used to assess whether the technology available is useful for supporting an e-learning initiative. Infrastructure is the common factor in all the models, and therefore there is a question is whether an organization has the necessary software and hardware to effectively use e-learning. Adams and Morgan (2007) identify differences in the focus of e-learning since its use began to become popular. They describe, the “first generation” e-learning where technology infrastructure was set up first and the need or use for it defined second. As e-learning evolved the “second generation” e-learning strategy identifies the needs of the users and possible pedagogical approaches before choosing the relevant technology. This shift in thinking about the role of technology in e-learning led to the question of whether there is a minimum infrastructure requirement for e-learning adoption. The next section will attempt to answer the two questions: What is the minimum requirement for computer technology adoption in e-learning? What features of e-learning support adaptability?

What is the minimum requirement for computer technology adoption in e-learning?

What is the role of technology in e-learning? The role may vary depending on the organization’s’

need. The technology may be used to support formal training activities and even informal practices. Earlier versions of e-learning used static media such as CD ROMs; today the delivery tools are much more flexible and depend upon either an intranet or the internet for distribution. Successful distribution depends on the ability of learners to access content. “No e-learning strategy will be viable if people can’t get to the Web. At its basic level, access simply means everyone (or at least most people) can get online. If people do not have basic access, nothing else matters” (Rosenberg, 2001, p. 152). Though Rosenberg only mentions the internet for access, many organizations use intranets. Access can be from home or at work. If learning takes place at home, learners need to have the necessary equipment and software to get into the system. In her tool, Haney (2002) adds two questions related to where technology will be used. “What are end-user requirements? What are remote access connection speeds?”(p.14). Barrow (2003) recommends adoption of the simplest forms of technology that can operate on the lowest technology requirements of a user. Using the lowest technology specifications possible does not only affect people trying to access the system from home but also employees who do not use computers for work. Employees may be working out in the field. These employees need special access (Rosenberg, 2001). Internal training requires learners to have ways of accessing and using content during work hours and this has to be facilitated by the availability of devices and proper policies to guide matters related to technology (Khan, 2005).

Whether learning takes place at home or at work, the infrastructure can impact the format and delivery of content. Text based content formats place the least amount of strain on bandwidth; however, they tend to discourage engagement of learners. To provide the necessary stimulation, along with the increased sophistication of content formats, e-learning materials are including more multimedia which require better bandwidth and infrastructure. Increased

bandwidth enables delivery of more flexible forms of e-learning but high bandwidth is not always available. Schweizer (2004) states that learners are different, and so it is worthwhile to take advantage of the various multimedia options. NYNEX used computer based training involving text and graphics for awareness training, and used simulation training for knowledge transfer (Howard, 1998). This approach matched the design to the training goal. Therefore, the balance must be found between getting good access with limited lower bandwidth designs and adding variety to e-learning offerings using high bandwidth multimedia components.

Where training will take place not only affects access but also usability. Davis's (1989), Technology Acceptance Model identifies a relationship between an Information Systems innovation and the quality of the system delivery. Interruptions in learning or difficulty with getting information influence whether learners continue to participate in e-learning. Keramati, Afshari-Mofrad, and Kamrani (2011) indicate that low internet speeds result in problems and dissatisfaction among learners. Davis (1989), states that if users perceive that the system is easy to use, then they will be willing to persist with the technology. The Delone and McLean (D&M) Success model (2003) was developed to determine the success of Information Systems within organizations. The model identifies relationships among several variables: information quality, system quality and service quality. These three variables can answer questions about the overall quality of the system.

Several factors determine what technology is needed for e-learning. The performance need guides the content and skill to be developed while the location of training influences some of the technology decisions. Access to the e-learning system should be the primary factor guiding technology decisions. The quality and the usability of the system influence whether learners will want to access it. This means that although there is no set minimum requirement,

all initial infrastructure decisions must be aimed at facilitating and encouraging this access. The accessibility need is dependent on what the content and delivery will look like. Once again the minimum requirement for technology has to be related to the goal of the training. Table 14 summarizes some of the themes that can be used to determine technology readiness.

Table 14. Themes for computer technology

Theme	Description
Infrastructure • Hardware • Software • Usability • Quality	The infrastructure that exists with relation to the context. The use of the infrastructure to meet the specific needs of the organization. The ease of use of the system
Accessibility • Connectivity • Bandwidth	Learner access to learning resources, and the reliability of the access.

What features of e-learning support adaptability? The identification of content and the possibility for adapting existing content to e-learning initiated curiosity as to whether there were other aspects of e-learning technology that could accommodate adaptability. E-learning, as indicated previously, is flexible in many ways. It can use different modes for delivery, it can be delivered anywhere any time, and its content can be changed to suit the context. It is adaptable in that it has the ability to change to suit the environment. In this research adaptability, encompasses the ability of several systems related to e-learning to change. These include content, integration of old systems with new and the ability of the system to be updated and constantly meet the needs of the organization. Change occurs when an innovation is redefined and restructured to suit the organization (Rogers, 2003). This means that in order to determine

the features of e-learning that support adaptability, it is necessary to have an idea of what currently exists and how the new system can fit into it.

Learners are used to traditional delivery of content and so initial concerns about adaptability center on the ability of traditional content to be translated to digital content (Schweizer, 2004). The way content is presented has moved far beyond simply translating information from traditional teaching formats to very flexible and interactive formats. But the general idea of mimicking or getting similar outcomes to traditional face-to-face instruction in e-learning continues to be a perceived challenge even though studies have dismantled this claim (Lockee et al., 1999). This perception stems from the belief that e-learning is only suitable for improving certain types of skill. Some believe that any types of skill can be taught using e-learning on the basis of good pedagogy, while others believe that e-learning is only suitable for more procedural instruction “hard skills” versus “soft skills”, such as those required for customer service. Derouin et al. (2005). Barrow (2003) indicate that e-learning has been used in leadership training, and Abdon, Raab and Ninomiya (2008) in agricultural practices. These examples give the scope of e-learning as an instructional tool. With increasing sophistication of multimedia and better design possibilities, content and delivery possibilities continues to grow. It is a matter of whether the organization is willing to accommodate the production, maintenance and updating of the content.

“Just in time” content update is one of the features of e-learning that makes it attractive to organizations. With continuously changing competitive markets, employees need to be ahead in knowledge and skills. E-learning provides the possibility for permanent currency. This is one of its advantages over traditional learning systems. “Just in time” training provides a means of

keeping employees up to date (Womble, 2007). Keeping up to date depends on the ability of the e-learning system to accommodate these changes.

In order to store and keep track of information, many organizations use either LMS or CMS systems. Haney (2002) focuses an entire category of her tool on the LMS. Though it may not be necessary to put so much focus on the LMS, she includes one question that may be very useful. “Will the system be ERP (Enterprise Resource Planning) compatible?” (Haney, 2002, p.13). LMS/CMS systems are often expected to integrate with existing software within the organization. Integration has not only implications for IT but financial implications as well. If new tools can integrate with existing IT systems, they reduce overall costs (Rosenberg, 2001). Integration is especially relevant if materials are outsourced. Many vendor tools lack customization (Chute et al., 1999). This makes it difficult and costly to customize material that can integrate with existing systems. Therefore, the knowledge of what technologies exist in the organization is a factor to consider initially before e-learning adoption is undertaken.

The features of adaptability in e-learning are: The increased sophistication of digital delivery formats which can be manipulated to address any skills, “just in time” ability to update, and the potential for integration with existing systems. These three features of e-learning are some of the established reasons for using e-learning. Any assessment of readiness must include them to some extent. The themes that were gathered in relation to adaptability are listed in Table 15.

Table 15. Themes for computer technology

Themes	Description
Content • Design • Delivery	Once they have gained access to the content, the design and delivery format of the content in relation to organizational goals, expectations and performance needs.
Maintenance and updating	The methods and practices for maintaining and updating material
Integration	The current computer technology and the integration that exists between systems.

Summary of the Chapter

Chapter two began with an attempt to evaluate the features which make e- learning different from face-to face instruction. These include stakeholder attitudes, skills and knowledge; required infrastructure for assisting delivery; and the need to overcome cultural differences. Using technology in e-learning introduces an extra layer of complexity, which has to be overcome. This affects learners' willingness to use e-learning and the culture within organizations. Additionally, technology also impacts financial decisions for human resources and infrastructure as e-learning has system wide-implications. E- Learning requires both mental and physical investment.

The investment in e-learning affects three areas organizational readiness, learner readiness and technology readiness. These three broad areas were derived from the e-learning models examined. In relation to the three areas, several factors were found to be important to e-learning readiness these are shown in Figures 5, 6, 7. From these factors questions emerged which helped further clarify the factors and resulted in the development of themes related to organizational readiness, learner readiness and technology readiness.

CHAPTER 3

RESEARCH METHODOLOGY

Purpose Statement

Several conceptual models exist outlining relevant factors for determining e-learning readiness. E-learning readiness analysis is an investigation into an organization's capacity to support and sustain e-learning, as a means of delivering instructional interventions for remedying performance problems within the workplace. The purpose of this study is to build on these models through the design and development of a process tool to analyze e-learning readiness that practitioners can easily apply in real world situations. This design and development was done through a literature review and validation by an expert panel.

Introduction

This Chapter will describe the design, development and evaluation process of an e-learning readiness assessment tool for use by practitioners in determining the level of readiness within organizations who are considering e-learning. It is envisioned that this tool can be used as an assessment tool before implementation of e-learning as well as after e-learning has been adopted.

Research Question

Through a literature review and validation by a panel of experts this study will seek to answer the following question.

What features are necessary for an e-learning readiness assessment tool that is applicable to organizations setting up e-learning programs?

Summary of data collection procedures

Table 16: Summary of data collection procedures in relation to research questions.

Methodological Phase	Goal of phase	Data collection
Phase 1: Analysis, design and development phase	1. Identify factors relevant to e-learning readiness 2. Identify the features of the tool 3. Determine the sequence of steps to be used in determining e-learning readiness	1. Evaluate e-learning literature to determine factors. 2. Identify the structure and parts of the tool 3. Sequence steps for practical use.
Phase II: Formative evaluation	1. Determine the validity of content 2. Determine practicality of content.	1. Expert Review: Determine the reliability and content validity of content 2. Expert Review: Determine the practicality and effectiveness

Study Design

This study uses design and development research methods. Design and development research bridges the gap between theory and practice (Van den Akker, Branch, Gustafson, Nieveen, & Plomp, 2012; Richey & Klein, 2007). The current e-learning readiness models are conceptual models and show no process for determining e-learning readiness. An e-learning readiness analysis tool can provide an additional analysis, which can be used in making practical decisions about an instructional initiative. Design and development research can be classified into two categories, Type I and Type II (Richey & Klein, 2007). The focus and outcomes of each type of design and development research is different as illustrated in Table 16 below. Given the differences expressed in Table 17, this research is a Type II design and development study, since it aimed to develop an analysis tool for e-learning readiness that is designed to complement

existing analysis tools and it also focused on the analysis phase in Instructional Systems Development (ISD).

Table 17: Comparison of Type I and Type II developmental research

Research design	Type I	Type II
Objective	Product or program evaluation	Evaluation of Design, development and evaluation processes
Focus	Studying all aspects of the design process	Focus on a particular aspect of the ISD process
Context	Context Specific	Generalizable
End product	Improvement in context specific product or program	Improvement to models or technique Creation of general principles

Similarly, Visscher-Voerman and Gustafson (2004) list four design and development paradigms: instrumental, communicative, pragmatic and artistic. Of the four, instrumental most closely resembles type II research. The authors describe this as a planning- by- objective approach, in which the analysis phase bears great weight and informs the final outcomes. “The approach they represent devotes (often extensive) time to exploring and formulating the intended outcomes of the project resulting in concrete project goals and learning objectives” (p.17). This paradigm is very focused on the original goal of the research and emphasizes the relationship between the final product and the original goal. One of the goals for creating this tool was to produce a job aid which can be practically and easily applied. The tool was evaluated on the basis of this objective. This design and development research study, resulted in an analysis tool deliberately geared at e-learning for determining e-learning readiness before instructional design events.

Research Design

According to Richey and Klein (2007) design and development research activities should follow an ISD model. Wedman and Tessmer (1993) however, found that instructional designers rarely use all phases in the ISD process for development. In developing their Layer of Necessity model, Tessmer and Wedman (1992) propose that different layers of ID may be used based on the design situation. Phase I in this research included the four ISD steps, analysis, design, development and evaluation. The focus of each step is different and these are outlined in Table 18.

Table 18: Summary of research design process

Design Phase	Questions	Data Collection and Analysis
Analysis	1. What are the factors that determine e-learning readiness?	1. Literature Review 2. Review of e-learning readiness models 3. Review literature for clarification of concepts. 4. Develop themes related to e-learning readiness
Design	1. What are the necessary components of the tool?	1. Create a first draft of the tool
Development	1. What is the sequence of events /steps necessary for determining e-learning readiness?	1. Relate the objectives for tool design to the product 2. Refine the tool
Evaluation	1. How are the parts of the model assessing what it set out to do? 2. Is the sequence effective?	1. Expert Review: Determine the content validity 2. Expert Review: Determine the practicality and effectiveness of the tool

The research design uses qualitative approaches since a great part of the research involved doing a text analysis in the literature review. Qualitative approaches include text analysis and interpretation of themes and patterns. The design also employs methods which include open-ended questions and emerging approaches (Creswell, 2013). This is also an exploratory design since another goal is to clarify concepts related to e-learning readiness in a relatively unexplored area within instructional design and human performance. This type of research has less structured designs and is generally qualitative (Singleton, Straits, & Straits, 1993).

Phase I: Analysis, Design and Development

Literature identification and retrieval. A literature search was conducted using databases in the Virginia Tech library resources and Google Scholar, particularly EBSCOHost, Education Research Complete, Business Source Complete and Business data bases from ProQuest. The search terms used were: “e-learning in organizations”, “e-learning”, “e-training”, “computer based learning”, “distance training” and “computer based training”. References from relevant literature were used to find primary sources and other related articles. The literature yielded a variety of peer reviewed empirical studies, industry documents, and books related to e-learning implementation and adoption.

Analysis phase. Literature reviews conducted in Type II research are used to describe models related to or similar to those being studied; describe research on one process; or explore factors affecting the model or process (Richey, Klein, & Nelson, 2004). For design and development research, Van den Akker et al. (2012) state the purpose of a preliminary investigation of the problem is to gain “State of the Art knowledge” (p.7) of the literature. This analysis helps build a conceptual framework for the tool development (Ellis & Levy, 2010). The

results of the preliminary literature review are described in Chapter 2. Models were chosen on the basis of the number of times they were cited and used in other e-learning literature, the ability to retrieve and review them and the contexts in which models were developed. Some of the readiness models referred to commonly in the literature were no longer obtainable because the websites were inaccessible. The researcher wanted models developed from different contexts in order to get a more general idea of the factors that were important in various cultural settings. The models were compared and contrasted in order to come to consensus on the factors required for e-learning readiness.

After determining the factors required for e-learning readiness, several concepts remained unclear. In order to clarify these concepts, questions were formulated to be used in the next phase of the literature review. Literature related to various disciplines were used to develop themes, which guided the development of questions used in the surveys. The themes were also used to examine e-learning literature in the design phase. Nunamaker, Chen, and Purdin (1990) state that the study of relevant disciplines should be included in the initial stages of systems development research in order to get additional ideas and new approaches for the design. The literature used included books and articles on established and emerging theories and frameworks; literature reviews on e-learning and existing e-learning readiness tools. Examples of these bodies of literature are given in Table 19.

Table 19. Examples of bodies of literature used in the analysis process.

Topic	Reference
Learning organization	Garvin et al. (2008); Argyris and Schon (1996); Blackler (2002); Senge (1990); Rosenberg, (2001)
Organizational Innovation	Ely, (1990); Rogers (2003)

Topic	Reference
Human Resources and Knowledge management	Ely (1990); Rosenberg (2001)
Learner characteristics, knowledge and skills	Dabbagh (2007) ; Guglielmino and Guglielmino (2003); Knowles (1978); Piskurich (2004)
Technology requirements	Davis (1989); Delone and McLean (2003); Rosenberg (2001); Rosenberg (2007)
E-learning readiness tools	Floyd (2003); Haney (2002); Khan (2005)

Design phase. Van den Akker et al. (2012) describe the second phase of design and development research as a process of theoretical embedding of information. This involves application of theoretical knowledge to the development of the tool. This was done in order to identify factors which would assist with successful implementation of the tool. It is important for researchers to determine environmental factors which would affect the tool meeting its objectives (Nunamaker et al., 1990). For this stage three criteria were used in choosing the literature.

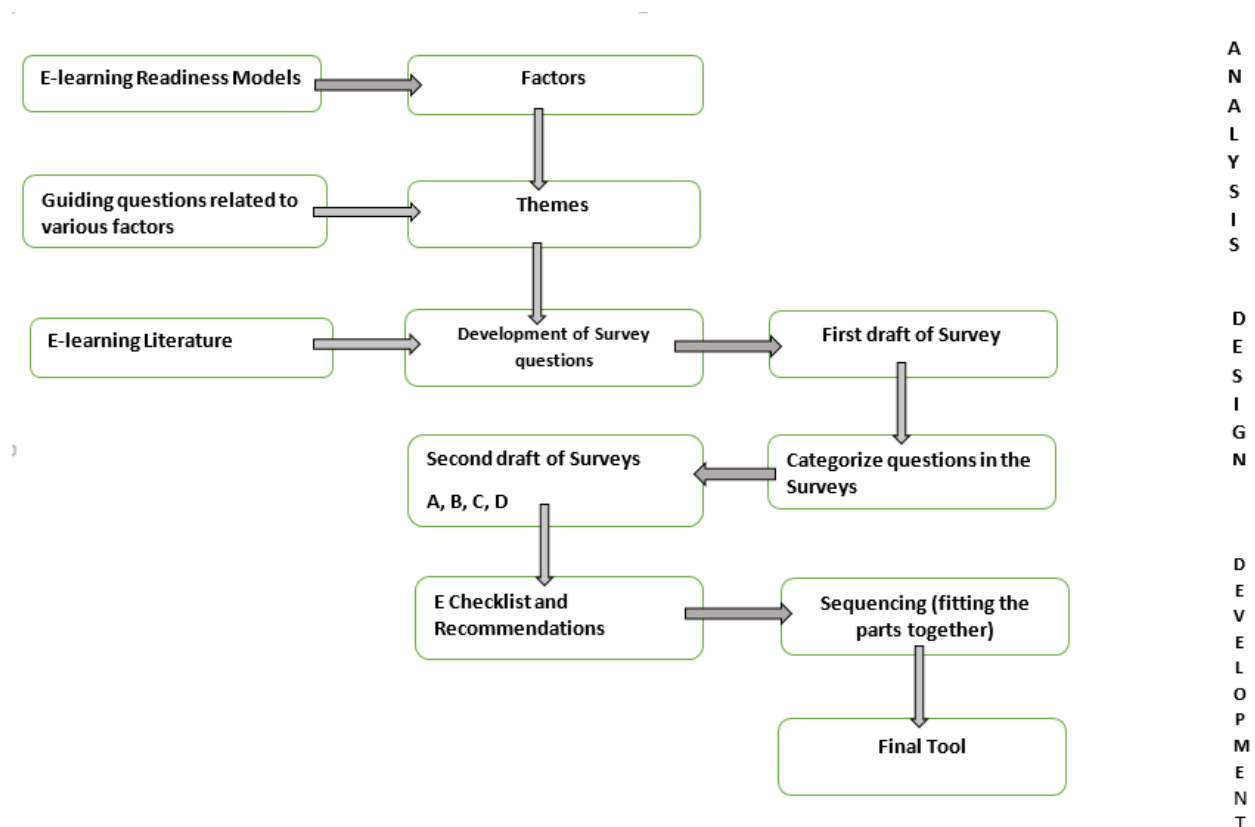
1. Empirical qualitative and quantitative studies which give a thorough description of the organization's processes and background with respect to e-learning.
2. Quantitative studies showing correlation and causal relationships between e-learning factors.
3. Business publications and books giving in-depth descriptions of implementation and adoption processes for e-learning in a specific organization.

In the initial selection abstracts were used to get a sense of the research. The researcher then read through the entire article to determine relevance and usability in relation to the themes.

Data Collection. Each article was reviewed for evidence of themes. All studies were coded and analyzed using the themes developed from the literature review as described in

Chapter Four. “ Coding requires looking for the right word or two that best describe conceptually what the researcher believes is indicated by the data” (Corbin & Strauss, 2008, p.160). The literature was coded for occurrences of the themes and analyzed for meaning with respect to e-learning readiness. The processes of planning, implementation and adoption in the case studies were carefully reviewed in the coding process. Identifying the meaning of data is more important than the actual procedures used in the coding process (Corbin & Strauss, 2008). New articles were selected until saturation. Saturation is the point at which the data adds no new concepts or ideas (Charmaz, 2014). After collecting the information the researcher reviewed the results for redundancy and overlap of themes. In the case of overlap, these themes were collapsed into single categories. Figure. 9 shows the sequence of this process.

Figure 9. The sequence of the design and development process



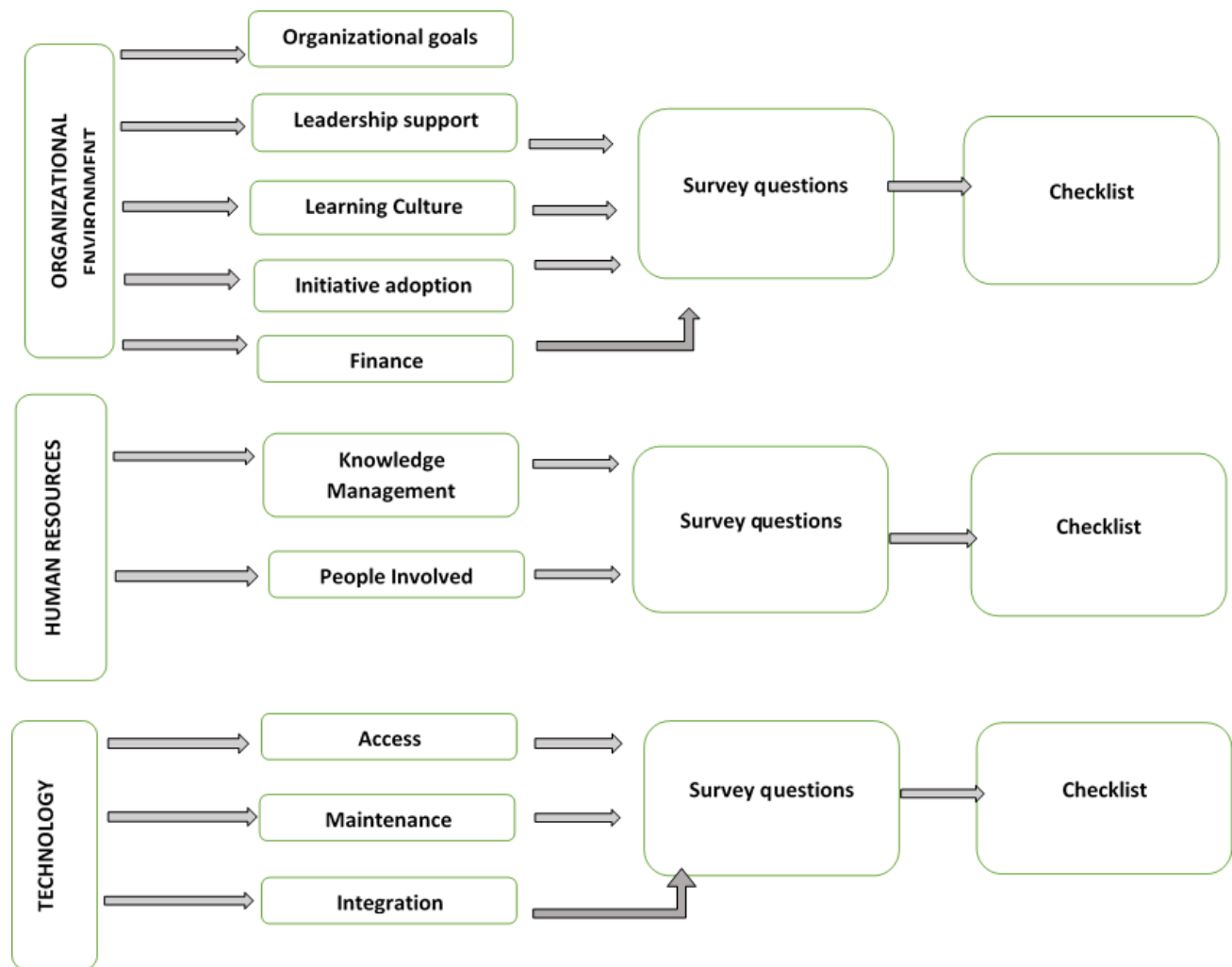
Survey questions and formulation. Survey questions were aligned with the themes and findings from coding the literature. Initial survey questions were grouped under the broad three headings of: organization, learner and technology. This represented the first survey draft. The second aspect of the survey question formulation was to determine the participants for the surveys. From the review of the literature it became apparent that participants from many of the studies were from one department only; for example Newton and Doonga (2007) interviewed only HR and training managers for their views on e-learning implementation. These participants were asked to make assumptions about other groups within the organization with respect to e-learning readiness. Therefore, the researcher thought that a key feature of the tool should be the ability to collect data from various groups within the organization on their level of e-learning readiness. Surveys were developed for key groups referred to in the literature. For example the HR in all the models as a factor in determining e-learning readiness. Therefore, including a survey geared at attaining the HR perspective was plausible. The survey groups were organizational leaders, human resources personnel, learners and IT personnel. See Appendix A, B, C, D for the full survey.

The four readiness surveys were labelled as followed –

- A.** Organizational Analysis - Leadership (Leadership/ Management Survey)
- B.** Organizational Analysis- (Human Resource Department Survey)
- C.** Learner Analysis Survey (Employee Survey)
- D.** Technology Survey (IT department)

In reviewing the survey, the researcher recognized that some of the questions needed to be clustered. These clusters represent the categories that appear in the second and final drafts of the surveys. Figure 10 shows the general structure of the surveys.

Figure 10. The structure of the surveys



Development phase.

The objective of the development phase was to shape a tool into one that could be used practically. Design and development stages involved defining components (Nunamaker et al., 1990). On completion of the first draft of the surveys it was important to determine how they could be designed so that all the information collected from them could be used to determine e-learning readiness in a realistic sequence. It was perceived that when the four were administered there was no practical way of collating the information. There was need for an additional

mechanism to capture the information. An additional piece was added to the tool so that information gathered could be converted into a useable reporting format. The final Checklist and Table (E) were developed to address this concern.

Table E has additional columns not included in surveys (A – D). The columns labelled support systems, learner concerns and content design were included as a result of a reassessment of the survey questions. It was found that the questions logically fitted into three clusters, support systems, learner concerns and content analysis. These three new clusters intersect all the categories developed for the Surveys A-D (See the example in Table. 20 and the Table E in Appendix E). Table E also consist of a checklist for simple reconciliation of data and recommendations developed from best practices and recommendations in the literature See Appendix G. The recommendations are suggestions of what to look for in the e-learning readiness analysis but are not meant to be outcomes. See Appendix E for the complete Table E. Table 20. Below gives an example of the first part of Table E.

Table 20. A sample of Table E.

	Support Systems	Learner	Content Design	Checklist	Recommendations
Organizational Environment	Organizational Goals 1. What is the vision/mission of the organization?	1. What is the mission/vision of the organization?	1. What knowledge or skill is the organization trying to improve?	☐ Mission/ Vision exists ☐ Everyone is aware of the mission/vision	1. Performance goals should be linked to organizational goals which in turn is related to the type of content and choice of technology. 2. Employees should see the link between their jobs and training within the organization

Phase II: Formative evaluation

This phase represented an expert evaluation of the e-learning readiness tool. In type I design and development research formative evaluation is done throughout each phase in the developmental process (Van den Akker et al., 2012). In contrast, Visscher-Voerman and Gustafson (2004) state that formative evaluation in type II research may serve as a check to determine if objectives have being met. Tessmer (1994) proposes that in traditional design and development research, formative evaluation would chart the following sequence: expert, one -on - one, followed by small group and field testing. He proposes new approaches to formative assessment given the new challenges that have emerged in formative assessment; for example, geographically dispersed experts, limited resources and emergence of new technologies that may assist in gathering evaluation material. For the purpose of this research, two types of expert reviewers were used: expert reviewers to determine the quality, efficiency and effectiveness of the tool (Van den Akker et al., 2012), and others to determine content and construct validity.

Each type of expert review used three (3) experts. These participants were sent an interview package in advance via e-mail. The expert review package contained 10 documents: (See Appendix A-E and H-L for contents of the interview package)

1. Informed Consent form
2. Guidelines to the E-learning Readiness Tool which should be read first since it gives a background of the research and how to use the tool.
3. Seven parts of the E-learning Readiness Analysis tool.

A- Organizational Readiness- Leadership

B- Organizational Readiness- Human Resources

C- Learner Analysis

D - Technology Analysis

E1- Organizational Environment – Checklist and Recommendations

E2 - Human Resource - Checklist and Recommendations

E3- Technology- Checklist and Recommendations

4. Semi structured interview questions.

Experts were given two weeks to review the tool and this was followed by a video interview. Since each group of experts reviewed the tool from different perspectives, the evaluation criteria were distributed within the same time period. The video interviews were conducted via WebEx which has the capability of capturing both audio and video as well as recordings. WebEx also allows users to call in the event of difficulties with internet access. Due to bandwidth difficulties some interviewers opted for only audio option. Interviews were recorded to reduce error in transcription, review, and analysis (Richey & Klein, 2007). The interviews were then transcribed. Interviews were used to gain opinions on the tool and clarify suggested changes in the tool.

Expert review content validity. Experts reviewed the tool to determine content and construct validity. Does the content within the analysis tool match the features found to be important for e-learning readiness? If the construct is valid the tool should show how the components are linked to one another. The characteristics of the experts were as follows; (See Appendix H and I for interview questions)

Expert reviewers for content validity were:

- Dr. Shahron Willams- Van Rooj, Associate professor, George Mason University (Organizational Readiness). Dr. Van Rooj reviewed the Leadership survey and Human Resource survey.

- Dr. Anthony Pina, Dean of Online Studies, Distinguished Lecture of Graduate Studies. Sullivan University (Learner Readiness). Dr. Pina reviewed the learner survey.
- Dr. Tonya Amankwatia, Director of the Center for teaching and learning at Regent University (Technology Readiness). Dr. Amankwatia reviewed the information technology survey.

Expert review construct validity. Since this tool hopes to bridge the gap between theoretical and practical, the functionality of the tool needed to be examined. Nieveen and Gustafson (1999) suggest that practicality and effectiveness be built into formative evaluations. Practicality points to how users or experts view the intervention as usable in real or naturalistic conditions. Effectiveness determines how the outcomes relate to the initial objectives of the intervention. Three (3) experts who are practicing instructional designers reviewed the tool to determine the effectiveness and practicality. These reviewers gave feedback on the tool.

Expert reviewers for construct validity were:

- Dr. Lujean Baab, Senior Director, Networked Learning Design and Strategies (NLDS) Technology-enhanced Learning and Online Strategies (TLOS), Virginia Tech
- Dr. Camille Dickson- Deane, Instructional Designer, Montgomery County community College.
- Dena Coots - Director Distance Education, Alvin College

The results from the expert reviews are presented in Chapter Five.

Phase III: Review of Findings

Data collected from expert reviewers in the formative evaluations in phase II were used to review and summarize findings. The transcribed interviews were reviewed for themes related. The themes were developed from responses to the interview questions. Similarities and differences were examined. In addition to the design and development of the e-learning readiness analysis tool information on the sequence and requirements for e-learning readiness will add to existing literature while still being useful for practitioners. An evaluation of the emerging data was conducted and linked to the research question.

CHAPTER 4

THE E-LEARNING READINESS ANALYSIS TOOL

Introduction

This Chapter outlines the design and development process which led to the development of the final tool. Ellis and Levy (2010) describe three critical areas in the design and development process of tool development, one of which is creating a prototype from system architecture. System architecture involves identifying relevant components of the tool and the relationships that exist between them (Nunamaker et al., 1990). One of the methods suggested for developing a system architecture is a literature review. The design phase uses e-learning studies to identify features related to contexts where e-learning has been used and helped to identify factors which would contribute to successful implementation of e-learning. One of the outcomes of design and development tool research is to identify conditions that will impact the tool (Richey & Klein, 2007). The development phase explains the sequence of steps needed to use the tool and the relationships that exist between each component. The development phase also describes how the tool can be used to meet the desired objectives (Van den Akker et al., 2012; Nunamaker et al., 1990). The following sections proceed to highlight some aspects of the tool.

Design

Application of themes

The design phase built on the results of the analysis phase. In the analysis phase the literature review resulted in the development of themes based on several disciplines, this expanded ideas for areas which should be included in the tool (Nunamaker et al., 1990). This resulted in the development of various themes which were used to code the e-learning literature.

The coding helped identify conditions which were important for successful implementation of e-learning.

From the analysis and design phase questions were developed related to these themes. These questions were then included in surveys. The first survey draft comprised questions under the broad headings of Organizational readiness, Learner readiness and Technology readiness. The researcher recognized that though the questions were related to the themes, these broad heading may make it difficult to apply and gain the necessary information. The researcher then returned to the original themes from the literature review and also reviewed the literature again noting ways in which authors had gained information from participants. The results of the additional review, was to collapse of the themes into categories and to develop separate surveys.

The categories were developed from the themes. Table 21. shows the progression from factors to themes to the categories on the Surveys. These are the categories used in the narrative for this section.

The separate surveys were developed in order to receive feedback from several points in the organization. The surveys were labelled as follows:

- A.** Organizational Analysis - Leadership (Leadership/ Management Survey)
- B.** Organizational Analysis- (Human Resource Department Survey)
- C.** Learner Analysis Survey (Employee Survey)
- D.** Technology survey (IT department)

The target participants were determined based on the groups who were identified as important to e-learning in the literature. Groups found to be the focus of e-learning research were, leaders (Ali & Magalhaes, 2008; Annansingh & Bright, 2010), human resource (Borotis, Poulymenakou, & Karamanis, 2005; Newton & Doonga, 2007), employees as learners (Harfoushi, Obiedat, &

Khasawneh, 2010; Waight & Stewart, 2005) and information technology personnel (Proctor & Gamble, 2005; Schreurs, Sammour, & Ehlers, 2008)

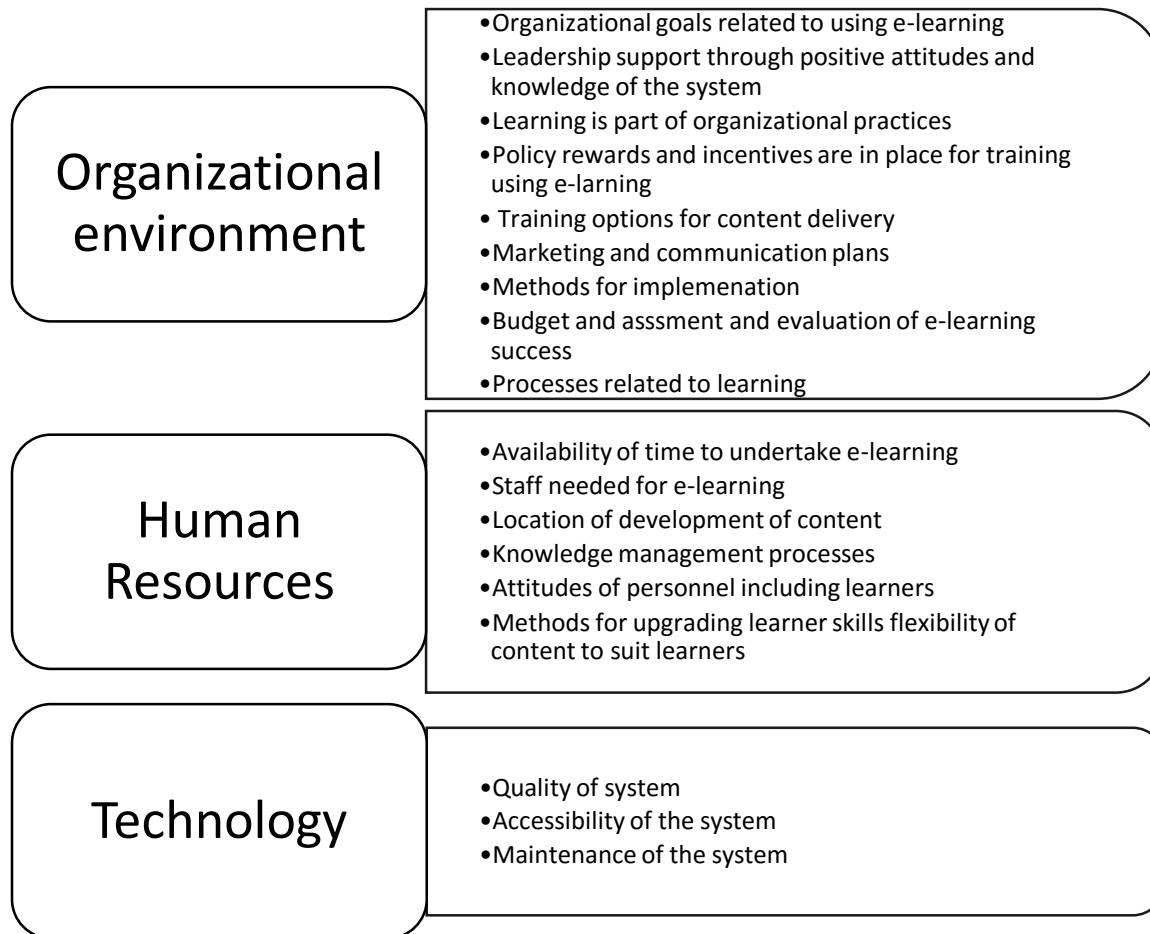
Table 21. A summary of the themes developed for organizational learning

	Factors from models	Themes emerging from the questions	Categories on Surveys
ORGANIZATIONAL READINESS	Culture - Learning organization - Change management - Goals and strategies - Context Human Resources -Employee skills and competencies -Tracking and Knowledge Management Financial - Costs - Stakeholder support and decision making - Policy - Power allocation	Leader Attributes and support Organizational and performance Goals Rewards and incentives Systematic and learning processes Knowledge and skills for implementation Support structures /Resources Communication Learning environment/learning culture Implementers Existing Staff Future Staff Knowledge management Financial Costs Savings Policies Incentives Marketing and communication Evaluation and assessment	Organizational Environment - Organizational goals - Leadership support - Learning Culture - Initiative adoption - Finance Human Resources - Knowledge Management - People involved
LEARNER READINESS	Prerequisite skills and competencies -Technical skills - Prior knowledge Competence -Computer experience Learner characteristics - Motivation - Attitudes	Prior experience Pre requisite skills and knowledge Attitudes Habits related to technology Self-directed/self-concept Application Involvement Motivation	Learner questions appear on Table E as its own column including all of the categories (Explained in the development section of this Chapter)

	Factors from models	Themes emerging from the questions	Categories on Surveys
	- Goals	Time management	
TECHNOLOGY READINESS	Infrastructure - Connectivity - Hardware - Software - Accessibility Adaptability - Content - Integration - Maintenance - Usability	Infrastructure - Hardware - Software - Usability - Quality Accessibility - Connectivity - Bandwidth Content - Design - Delivery Maintenance Integration	Access Maintenance Integration

Features of the contexts in which the tool will be used. From the e-learning literature review the following features found in the organizational contexts were considered in the tool design. These are outlined in Figure 11 and are discussed in along with question development in the next section.

Figure 11: Features found in organizational contexts



Question development

The following section describes the process used to develop questions used in the tool. Due to the size of the tool only a few questions are discussed here, as a way of illustrating the process used for question development. The full literature review is included in Appendix F.

Organizational environment.

The themes under organizational environment are summarized in Table 22:

Table 22. A summary of themes and their categories in the tool

Category	Themes emerging from the questions	Final tool categories
Organizational Environment	• Organizational and performance Goals • Systematic and learning processes	Organizational Goals
	• Leader Attributes and support	Leadership support
	• learning environment • learning culture • Rewards and incentives	Learning Culture
	• Communication • Learning environment • Systematic Process	Initiative adoption
	• Costs • Savings • Policies • Incentives • Support structures /Resources • Marketing and communication • Evaluation and assessment	Finance

Organizational Goals. Organizational and performance goals were one of the themes identified in the literature. The literature review found that a variety of organizational goals drove decisions to use e-learning. For example, Ho and Dzeng (2010) found that mandatory training, used to prevent loss of life in construction safety training via e-learning, aimed at reducing economic costs. Chuang, Chang, Wang, Chung, and Chen (2008) state that performance problems within the organization should be linked with the adoption and

assimilation of e-learning. Table 23. Shows a variety of organizational goals which drove the decisions to use e-learning.

Table 23. Reasons why organizations choose to adopt e-learning

Citations	Purpose for adopting e-learning
Borotis et al. (2005)	Uses reviews of corporate strategy to develop training plan and training objectives
Dai (2007)	The driver was to improve customer service
Harfoushi et al. (2010)	TAG – the organizations main goal was to save time and money Orange - save time and money, improve human capital, have a competitive advantage, support innovation
McKee (2006)	Used companies' 5 year strategic plans to link employee learning to company goals.

Borotis et al. (2005) link their corporate strategy to their training plans and objectives. This relationship was seen in several other organizations (Chuang et al., 2008; Harfoushi et al., 2010). The literature shows that performance goals are related to organizational goals (Dai & Duserick, 2007; McKee, 2006). Due to the relationships identified between organizational goals, training goals and performance goals. Therefore the following questions were included in the Surveys, “What is the vision/mission of your organization? (All Surveys) What is the objective of the training? (Survey A and B) What is the goal of training in your organization? (Survey A and B)”. These questions were determined to be important in order to discover the reasons organizations decide to use e-learning and how these reasons are related to organizational and performance goals.

Organizations such as General Motors University (2005) and Proctor & Gamble (2005) began the e-learning initiative with a definition of e-learning, which then lead the way for decisions about how e-learning could be used to achieve organizational goals. The question

“How do you define e-learning?” was included on every survey. From the relationships identified in these organizations the question was included to help determine organizational goals of e-learning from the perspective of group, since a definition of e-learning help clarify the general purpose and expectation of the organization with respect to e-learning.

Leadership/Management Support. Articles discussing leadership roles in e-learning and recognized the need for leadership support, although each organization had different definitions of what a leader should look like. Harfoushi et al. (2010) describe the ideal characteristics of good leaders in the adoption process, and their need to be convinced about the value of the system which is in line with Rogers (2003) category of leadership characteristics. Ali and Magalhaes (2008) describe two problems in leader attitudes. Firstly senior managers see e-learning as a “cheap” or watered down option to training. Secondly, middle managers are afraid of empowering employees, fearing that they will take their jobs. This resulted in reluctance to encourage use of e-learning. In order to determine leadership attitudes toward e-learning the question “What is your view on using technology for learning?” (Survey A) A variation of this question was also added to (Survey C and D). Since lack of management support was shown to result in reluctance employees to use of e-learning (Harfoushi et al., 2010).

Management support affects how learners perceive e-learning usefulness and ease of use (Purnomo & Lee 2013). Leaders can serve many positive roles in the e-learning initiative. Even in situations where support was lacking recommendations suggested the need to get leaders on board (Annansingh & Bright, 2010; Purnomo & Lee, 2013). Leaders can be first adopters which is very important for “selling” e-learning and successful implementation. Their experiences with the system help them to understand realistically the challenges faced by the employees and to acquire the technological skills needed to navigate the system (Borotis et al., 2005). Chuang et

al. (2008) states that managers should create opportunities for learners to use new knowledge. Since leaders hold positions of power, a leadership perspective is shown to be important for determining e-learning readiness. In the literature it is shown that they set the pace and atmosphere with respect to learning generally and e-learning specifically.

Learning Culture. There were very few studies which addressed the idea of learning culture directly (Chuang et al., 2008; Proctor & Gamble, 2005). The researcher found that good indicators of learning cultures were found in descriptions of learning processes and practices. Wong (2015) suggests that “e-learning is an important tool for accelerating the effectiveness of organizational learning.”(p. 221). IBM (2005) began its e-learning initiative with a learning vision to create an environment where it is easy to learn, share and use knowledge. They did this by integrating e-learning into the routine activities of the company. While formal events are useful to carryout targeted knowledge and skill development, informal learning events provide opportunities for knowledge sharing and best practices within organizations. A supportive learning environment was found to be reflected measures used to promote and change attitudes toward learning.

Another way organizations tried to encourage learning is by offering a variety formats. Table 24. Shows the variations in offering in organizations. Organizational learning should provide an environment of equal learning opportunity for all (Chuang et al., 2008). Proctor & Gamble (2005) offered e-learning courses free. At the same time in order to encourage learning the same content was delivered in alternate modes. This method ensured that learning took place by whichever method learners felt most comfortable. The variation observed in Table 24 also shows that e-learning is a part of more than one training delivery format. Hence, the question “What training methods have been used in the past?” is included in Survey B (the HR survey).

E-learning adds additional strain on the work life balance and so it was necessary to offer more flexible learning options both in time and in content structure (IBM, 2005).

Table 24: The types of formats used for training

Citation	Types of formats.
Waight and Stewart (2005b)	Case study 1. Insurance company- e-learning activities, workshops, online courses, blended and instructor-led training. Case study 3. Retail store – blended, computer based modules, virtual classrooms
Dai and Duserick (2007)	NCR Corporation - Centralized learning processes, blend of e-learning and classroom training, personal development programs
Borotis et al. (2005)	Several options for corporate training- classroom based, on the job, self-training e-learning (note here how e-learning is defined)
General Motors University (2005)	Classroom delivery, satellite broadcasts, electronic and web applications, learning laboratories

Rewards and incentives were a theme found to be relevant in e-learning adoption. Several types of learning rewards and incentives were offered to encourage e-learning as seen in Table 24. Two types of rewards were used, intrinsic motivators through individualized learning pathways (Borotis et al., 2005; Waight & Stewart, 2005b). Extrinsic motivators found in the literature included certificates, gifts and promotions. Special mention must be given to the impact of time on e-learning. Time is an unusual extrinsic motivator but several studies identified lack of time as a barrier to successful e-learning (Annansingh & Bright, 2010; Ettinger & Holton, 2005). Extra hours are needed to use e-learning so consideration of how e-learning fits into the workday is necessary. Table 25 shows the types of incentives used.

Although learning culture plays a big role in successful adoption of e-learning in this tool only questions that were related to value and processes were added. In the organizations which

showed positive learning culture (Chuang et al., 2008; Proctor & Gamble, 2005) e-learning became an additional part of their efforts to encourage learning. It can be concluded from the literature that positive learning culture, facilitates better acceptance of e-learning. The questions in the table were aimed at determining the incentives and rewards that exist and how these provide motivation for learners.

Table 25. Examples of the types of incentives used and questions

Themes	Citations	Questions
Incentives and rewards	• Development of individual road maps and achievement goals road maps (Borotis et al., 2005;. Waight & Stewart, 2005b) • certificates (Chuang et al., 2008; Harfoushi et al., 2010) • Monetary and gift rewards (Harfoushi et al., 2010; Steenekamp, Botha, & Moloï, 2012). • Time given for study (Tai, 2007); Waight & Stewart (2007 • Extrinsic incentives should relate to established policy (Comacchio & Scapolan, 2004)	1. What incentives does your organization offer for training?(All surveys) 2. What motivates you to pursue further training/ learning? (Survey C)

Initiative Adoption. Adoption of e-learning requires a change, a change from what employees are used to for instructional delivery (Nakayama, Proano, Pilla, & Silveira, 2005). How is the initiative going to be accepted and sustained? There were several themes shown to be related to initiative adoption. One of the biggest changes identified is the ability to overcome resistance and create positive attitudes toward the new format (Becker et al., 2013; Schreurs et al., 2008). For this section the topics discussed are systematic processes and communication as part of initiative adoption as a way of overcoming resistance.

Examples of methods used to initiate adoption are outlined in the Table 26 along with questions developed to identify the processes used in organizations.

Table 26. Themes on innovation adoption and questions

Themes	Citations	Questions
Communication	- General Motors University (2005) and Proctor&Gamble (2005) Proctor and Gamble both market e-learning to managers and leaders first so that they can assess the benefits of the training. (Chuang et al., 2008) Used the LMS to deliver news and offerings	1. How do you plan to promote e-learning?(surveys A and B)
Processes	- NYNEX adopted the technology that was available at the time. With each iteration new tools with different attributes were used (Howard, 1998) - BBC in Ettinger and Holton (2005) took a less structured approach and their initiative still progressed successfully. They began with a small project and a few people who were enthusiastic about e-learning	1. How has your organization handled new initiatives in the past? (Surveys A and B) 2. How do you plan to implement e-learning? (Survey A and B)

Early literature on e-learning such as Rosenberg (2001) emphasizes need for a change management plan for successful implementation of e-learning. The case studies proved that this was an incorrect assumption since several cases did not have a change management plan but were still successful at implementing (Ettinger & Holton, 2005; Harfoushi et al., 2010). It was therefore deduced that a plan for implementation is necessary with a group of people who are willing to push the initiative. Whether an implementation plan is in place or not learners cannot use the system unless they know what is offered. The literature review also showed that a variety of communication and marketing techniques were used through communication. Nakayama et al. (2005) identify lack of communication as a hindrance to the change process. The questions

“How do you plan to implement e-learning? How do you plan to promote e-learning? (Surveys A and B)” in order to get information on the processes that will be used in the e-learning implementation.

Finance. Very few of the studies mention financial concerns explicitly except when referring to the advantages of e-learning through the savings that it can accrue. The financial question is, however, one of the most crucial since it affects all parts of the e-learning initiative as seen from the themes related to finances. Hung, Chen, and Lee (2009) found that economic cost of the system has a negative influence on decisions to adopt e-learning. Cost considerations include incentives, personnel, marketing, and infrastructure. Many of these are discussed in other parts of this research. In this section the discussion will center on the methods of evaluation and assessment that companies used to determine Return on Investment (ROI).

One of the main difficulties found with quantifying e-learning is the overlap that exists between capital expenses and actual e-learning expenses. This is particularly difficult to calculate if the e-learning unit is integrated with the overall business. IBM (2005) acknowledges that despite evaluation plans it is difficult to relate learning results with business results. The methods described in Table 27 shows ways in which organizations tried to evaluate the value of e-learning. Methods used vary significantly. Many allow organization to see beyond the money to other improvements generated by e-learning. (Borotis et al., 2005; McKee, 2006; Proctor & Gamble, 2005). The variety in measurement methods prompted the idea to include a question “What are your plans for assessment and evaluation of an e-learning initiative?” (Survey A and B).

Table 27. Themes on Finance

Themes	Citations	Questions
Evaluation and Assessment	• HP Service Workforce Development (HPS WD) in Stewart (2005b) use mainly level 1 and 2 while levels 3 and 4 are done when needed. • Chuang et al. (2008) were able to use all four levels of Kirkpatrick, making them better able to see the changes in drop out disqualification of pilot rates. • Harfoushi et al. (2010) showed high reliance on the LMS for feedback on how employees use the system. In addition Orange used a measure of ROI derived from the original business case that was initially developed for e-learning • IBM (2005) has developed a 4 level e-learning strategy which incorporates evaluation of both types of benefit • Surveys are used internally to determine employee satisfaction with the system (Borotis et al., 2005)	• How have training initiatives been assessed in the past? • What are your plans for assessment and evaluation of an e-learning initiative? Survey (A and B)

The examples presented above are to show that there are no standard methods, but a process needs to be in place for evaluation of e-learning. E-learning requires upfront expenditure that has a long term implications (Chan & Ngai, 2007). Despite the difficulties with isolating financial data, finances are one of the main supports for e-learning. From this literature review it can be seen that finance affects personnel, technology acquisition and learners.

Human Resources themes and questions

Two main features were highlighted which relate to Human Resources, the people involved in the process and knowledge management. A summary of the themes are presented in Table 28.

Table 28. Summary of themes and their categories in the tool

Category	Themes	Final tool categories
Human Resources	- Implementers - Existing Staff - Future staff	People involved
	Knowledge Management	Knowledge Management

People Involved. There are three sets of people are involved in e-learning readiness, the implementers, the learners and the actual personnel needed for adoption. Multidisciplinary teams are valuable in planning and adopting e-learning (Hall, 2002). Using only one organizational group or department may result in the final product being skewed toward that group's objectives.

In the actual adoption of e-learning there are personnel sustaining the initiative. The literature shown in Table 29 shows variations in the composition of personnel needed for e-learning. E-learning content will be outsourced or internally developed. Borotis et al.,(2005) outsourced developers and used internal subject matter experts. Several organizations use a combination of internal development and outsourcing (General Motors University, 2005; General Motors University, 2005; IBM, 2005; Waight & Stewart, 2005b). Table 29 below shows the team members for the various cases. Because of the variation in the literature on this theme the question "What personnel will be needed to design, develop, administer, manage, maintain and support delivery? (Survey B)" was included.

Table 29. The combination staff required for e-learning

Theme	Citation	Question
Existing and future staff	Halliburton in Waight and Stewart (2005b) – team of 5 instructional designers, 4 multimedia specialists, 1 technical publishing specialist HPSWD in Waight and Stewart (2005b) a virtual team comprising curriculum developers, learners, delivery professionals and HP businesses Retail Store in Waight and Stewart (2005b) – 2 members solely focused on e-learning, 2 staff who have the roles of project managers, do design, creation, execution and evaluation Proctor and Gamble (2005) - the following roles were created to support the e-learning initiative, IT project leader, curriculum manager, Rapid Learn administrative expert, Web and data based personnel, IT learning experts, Authoring experts contractors to develop web content and web pages	What personnel will be needed to design, develop, administer, manage, maintain and support delivery?(Survey B)

In the few examples presented in the Table 29 there are differences in the composition of e-learning teams. The question on the tool presents an opportunity to inventory the current staff and future projections for e-learning.

Knowledge management. In the literature several systems are used to track employee progress, and store and share content used in e-learning as seen in the Table 30. The information is useful for managers to track learner progress (Newton & Doonga, 2007) while learners can monitor their individual progress (Proctor & Gamble, 2005). The question: “How is knowledge managed in your organization?” added in order to determine whether organizations have knowledge management procedures. Poor knowledge management practices can result in

difficulty in tracking employee information for example, Borotis et al. (2005) had fragmented processes for managing training. The responsibility was shared by three departments who had systems which did not operate in unison. This created redundancy with employee information, making it difficult to track employee progress.

Table 30. The systems used for knowledge management

Theme	Citation- System used and function	Question
Knowledge Management	Halliburton in Waight and Stewart (2005b) – LMS was used to track and access learner performance HPS WD in Waight and Stewart (2005b) used Business performance consulting model and in corporate e-learning to include KM and knowledge sharing activities Retail Store in Waight and Stewart (2005b) – no LMS was used but other data bases helped access data from surveys. General Motors University (2005) used Saba LMS to catalogue available courses, track participants and launch courses. IBM (2005) used several types of software to store purchased course, track employee information. Employees are also able to use the CareerPlanner to find information about themselves NCR in Dai and Duserick (2007) – data driven course management through the LMS	1. What courses have employees taken in the past? (Survey B) 2. What are employees' levels of education? (Survey B) 3. How is knowledge managed in your organization? (All surveys)

Learner readiness themes and questions

From the literature it could be determined that learners drive the e-learning initiative in several ways; they must be able to access the system, they use the system and they are the

beneficiaries of the system. Before developing e-learning courses some organization gain information about learner needs in several ways, for example conducting preliminary needs assessments (Chuang et al., 2008; Harfoushi et al., 2010) and asking employees and managers to submit information about the types of courses learners require to improve their job performance (Borotis et al., 2005; Harfoushi et al., 2010; Waight & Stewart, 2005b).

Since they are in control of other aspects of their lives then control in the learning environment is desirable (Waight & Stewart, 2005a). Learner control can also be achieved through content design. Content can be flexible in several ways: modularized, varied in multimedia options, varied in delivery options and varied in the types of information that are presented in the content, see Table 31 for examples. The table shows the themes which guided the development of the questions.

Table 31. Learner themes in relation to the questions

Theme	Citation	Questions
Involvement	- Halliburton in Waight and Stewart (2005b) – learner analysis does not occur for every course but front end analysis and work setting analysis provides information on factors affecting learners. - TAG in Harfoushi et al. (2010) distributes a training needs form among employees on a regular basis - General Motors University (2005) employees develop individual development plans. Training managers in individual businesses help determine individual training needs	- What is your role in decisions about organizational learning needs? (Survey C) - What will be the role of learners in the e-learning process? (Survey C)
Motivation	Womble (2007)- content was delivered in modules so that	What motivates you to pursue further training/ learning? (Survey C)

Theme	Citation	Questions
	employees were able to start and stop in the middle and come back to it. • The retail chain store in Waight and Stewart (2005b) used simulations, games, video and audio • IBM (2005), Dai and Duserick (2007)- Used several combinations of E-learning and classroom training. Asynchronous and synchronous modes.	2. What do you think e-learning should look like in order for you to use it?(Survey C)
Application	• Annansingh and Bright (2010) – found one of the barriers to e-learning use was that courses were not relevant to employees • HPS WD in Waight and Stewart (2005b) designs meaningful content in catered at addressing both short and long term performance needs. • Chuang et al. (2008) – courses were developed primarily to address the deficit in aviation safety knowledge at TransAsia	1. What are the opportunities for applying material learned in training?(Survey C) 2. How is training related to your job description? 3. How has training helped you with your job? (Survey C)
Time management	• Annansingh and Bright (2010) – 92% of trainees indicated that lack of time due to workload pressures and commitments were a barrier even though time was assigned • Borotis et al. (2005) – Lack of time available for e-learning due to heavy work load. Employees were encouraged to do e-learning at home. • Becker et al. (2013) – lack of time during the work day was seen as a barrier to e-learning due to potential interruptions • BBC in Ettinger and Holton (2005)- time was limited due to a pressured work environment.	1. What times of the do you access training? (Survey C) 2. What will determine whether you use e-learning or not? (Survey C) 3. What do you think needs to change to accommodate e-learning? (Survey C)

Learners are influenced to use e-learning when they find that content is applicable to improvement of their jobs. In the case study described in Engeström, Kerosuo, Netteland, Wasson, and Mørch (2007) the organization tried to standardize all the course offerings by delivering the same content and modules in the same order for four different units. Each unit had a different functions. This standardized approach did not work very well with some units lagging behind others. The results were affected by the lack of relevance of some of the content to some units and the inability to adapt to local unit needs. Engeström et al. (2007) recommends a differentiated approach which will cater to the needs of individual departments. The questions included in Table 31 are aimed at finding out how learners perceive their role of training in relation to their jobs.

Since computer technology is the difference between e-learning and traditional training learner attitudes and skills with relation to technology factors that should be captured to determine e-learning readiness. Harfoushi et al. (2010) state that learners questioned the validity of e-learning compared to other instructional formats. In order to determine learner attitude to e-learning one of the questions asked was “How do you feel about using computer technology for learning (e-learning)?”(Survey C). In addition to general attitudes about e-learning, learners previous experiences with e-learning affected their attitudes towards using it in e-learning. Purnomo and Lee (2013) found that since workers were used to using computers for everyday tasks their computer self-efficacy was high in relation to using computers for e-learning. However, Schreurs et al. (2008) recognized that even though employees have experience using computers they have little experience using e-learning. This lack of experience initially affected their ability to use e-learning packages. The questions “What is your experience with learning

using e-learning? What basic functions can you perform on a computer? How do you use computers now in your daily tasks?” were added to the surveys.

Technology readiness themes and questions

This statement, “Don’t get caught up in the technology..... Keep it simple and never underestimate how hard the technology will be for someone else” (Proctor and Gamble 2005, p. 124) captures the idea that though technology is important it does not exist in isolation. Table 32 shows a summary of the themes related to technology and the final categories included in the tool.

Table 32. Summary of themes and their categories in the tool

Category	Themes	Final tool categories
Technology	Infrastructure • Hardware • Software • Usability • Quality Accessibility • Connectivity • Bandwidth Content • Design • Delivery	Access
	Maintenance and updating	Maintenance
	Integration	Integration

In the case studies reviewed it became evident that connectivity, hardware, software and access are required for accessing instruction, some are shown in Table 33. Access affects both learners and content design. Previous sections described the use of several types of formats for

content in e-learning delivery. New formats, particularly those rich in multimedia, result in need for increased bandwidth to facilitate download and use of content. Bandwidth issues generally posed a barrier regardless of the type or size of the organization (Admiraal & Lockhorst, 2009). It can be concluded that if learners is unable to access the instruction then no learning can occur. The questions in Table 33 aim to find out the organization's capacity for creating access e-learning.

Table 33. Technology themes in relation to the questions

Theme	Citation	Questions
Access	- Bandwidth issues were a challenge for several companies (Admiraal & Lockhorst, 2009; Borotis et al., 2005; Harfoushi et al., 2010). - Borotis et al. (2005) state that trainees complained of difficulties downloading instructional material containing high multimedia content at their desk.	- How will the organization facilitate access to e-learning? (Survey B and D) - What do you anticipate will be barriers to e-learning? (All Surveys) - How will you access e-learning? (Survey C)
Maintenance	- Hung et al. (2009) used vendor systems that were able to directly integrate with the existing system. They found adoption barriers included incompatibility with existing systems, complexity and high costs. - Proctor and Gamble (2005) state two challenges to implementation as being overcoming the challenges of amalgamating HR data into the new LMS, and the usability of the LMS. - Nakayama et al. (2005) found that continuous technical interruptions during time dedicated to e-learning caused negative attitudes to e-learning.	- What are your current experiences with maintenance and updates of computer technology? (Survey C) - How does your organization currently, manage, update and sustain computer technology? (Survey A and D) - How do you anticipate e-learning fitting into the current IT structure?(Survey A and D)
Integration		

Theme	Citation	Questions
	Purnomo and Lee (2013); Ramayah, Ahmad, and Hong (2012) found that ease of use had a positive effect on intention to use an e-learning system	

If learners are expected to carry out e-learning at home there are complications, since infrastructure at home may not be as good as at work (Schreurs et al., 2008). This is why the question. “How will you access e-learning?” was included on Survey C since access is not only an organizational concern but also a learner concern.

Maintenance and integration. Maintenance and integration of e-learning technology have significant impact on the cost and the ability to sustain an e-learning system. Using technology that can easily integrate into IT structures that already exist saves cost (Hung et al., 2009). The quality of learner interaction with the system is related to learner willingness use the system. Nakayama et al. (2005) found that continuous technical interruptions during time dedicated to e-learning caused negative attitudes to e-learning. Purnomo and Lee (2013); Ramayah et al. (2012) found that ease of use had a positive effect on intention to use an e-learning system. The question “What are your current experiences with maintenance and updates of computer technology?” (Survey C) was added in order to determine learner experiences with technology.

Conditions impacting the use of the tool.

In the literature analyzed the distinctiveness of each context stands out. In no category is there total consensus on approaches used and experiences described. From this it can be determined that adoption should be regarded on a context specific basis and not as a one size fits all. In large organizations where there are various specializations e-learning cannot be applied across the

board (Hung et al., 2009; Raymond, Bergeron, & Blili, 2005). Hung et al. (2009) state that existence of specialization and function must be considered, as needs varied based on the size of institutions. Hewlett Packard (HP) used different training methodologies centered around employee preferences in geographically dispersed locations (Derouin et al., 2005). Hall (2002) describes levels of implementation; each level is based on the experience of the business with e-learning. General Motors University (2005) states that they may never move completely into e-learning but continue also to use classroom training depending on the training requirement. GM uses several methods of training based on content and purpose.

The variations in contexts presented in the literature was the main challenge to designing this tool. Since contexts were so different, the researcher needed to determine ways to design a tool that could capture the necessary information within each context. Ellis and Levy (2010) suggest analyzing alternative solutions as a way of determining the rationale for the solution selected. From review of several tools (Floyd, 2003; Haney, 2002; Khan, 2005), it was determined that very specific questions easily become outdated or unusable in different contexts, therefore, the choice for this tool was to keep the questions within the tool as generic as possible while still obtaining the necessary information for determining e-learning readiness.

Development Phase

Introduction to the Tool

Sequence of steps to e-learning readiness

The goal of this design and development research was to create a practical tool that can be used in organizations to determine their level of e-learning readiness. Edelson (2006) state that decisions about the design should meet the goals and needs of the design project. Decisions include what elements to add and leave out. Based on the literature review of organizations using

e-learning, organizational contexts are vary widely and can be dynamic involving many groups, therefore, from this it was determined that usability needed to be carefully considered if the tool is to be applied in a real settings. Design and development research involves considering challenges within the context where the tool will be applied (Edelson, 2006; Richey & Klein, 2007). This section describes aspects of the tool were developed to accommodate use in a real setting.

The Tool. This tool is divided into two main parts: the Surveys A-D, and E the final checklist and recommendations.

Readiness Surveys

Part 1.

In many instances surveys in the e-learning literature were conducted with one specific group within organizations to give information regarding e-learning. This approach gives a one sided perception of e-learning. The tool uses separate surveys in order to target several groups of people within organizations. This is a way to get perceptions of people first hand. It is important to note that not all questions appear on every Survey. From an assessment of the roles and responsibilities of groups in the e-learning organizations it was determined that not everyone would be privy to some of the information required to answer each of the questions.

Also this gives an opportunity to discover peculiarities related to particular sections and groups within the organization. Since the e-learning readiness analysis tool is designed to give a snap shot of the state of the organization with respect to e-learning readiness at a particular time, the separate Surveys A-D can collect data which would be relevant to the whole organization.

A. Organizational Analysis - Leadership (Leadership/ Management Survey)

B. Organizational Analysis- (Human Resource Department Survey)

C. Learner Analysis Survey (Employee Survey)

D. Technology survey (IT department)

Part 2.

E. Final Checklist Analysis Table including recommendations - (**E¹- Organizational Environment, E²- Human Resources, E³- Technology**)

The reasoning for Surveys A -D has been discussed in the Design section of this Chapter. The Final checklist Analysis Table (**E**) in Appendix E was developed as a way of capturing the information from the four surveys and translating the information into a format that is useful for the organizations, since the organization is the unit of interest in this study. Table **E** is very similar in structure to Surveys **A- D**. It incorporates the same categories as the surveys. This was deliberate since the information from these surveys needs to fit seamlessly into this table. The questions for each are very similar as well. Table **E** has specific column headings: support systems, learner and content design. (**See Appendix**).

When the questions were categorized at an organizational level, it was recognized that each of the questions falls into one of three groupings: support systems, learner concerns and content design. Examples of the questions related to each grouping are given in the Table 34 below. Each group of questions presents a different focus. For example, under support systems related to the organizational environment questions 1 and 2 attempt to determine where the finance will come from for the project since without financial support e-learning cannot move forward. Learner questions under the human resources category seek for employees' personal knowledge of themselves with relation to their qualifications and where they fit in the e-learning process. Content in relation to technology considers whether, for example, content can be designed to use less bandwidth.

Table 34. Grouping of questions in Table E

	Category	Questions
Support system	Organizational environment	1. Who will make the e-learning decisions? 2. What are the anticipated cost factors? 3. What are the anticipated savings?
	Human Resources	1. What are the training policies? 2. What personnel will be needed to design, develop, administer, manage, maintain and support delivery?
	Technology	1. What are the anticipated barriers to accessing e-learning? 2. How will the organization update and maintain e-learning?
Learner	Organizational environment	2. How is training related to employee job description? 3. How do managers feel about learning/training? 4. What motivates employees to pursue further training?
	Human Resources	1. What courses have employees taken in the past? 2. What will be the role of employees in the e-learning process?
	Technology	1. How do employees currently access training? 2. How will employees access e-learning? 3. How do employees feel about using computer technology for learning?
Content Design	Organizational environment	1. What knowledge or skill is the organization trying to improve? 2. How can content be designed to support training incentives?
	Human Resources	1. How do you envision e-learning will be structured? (modular, online, self- paced, job aide?) 2. Will material be designed internally or externally?
	Technology	1. How can content be adapted to facilitate access? 2. How will /is content be updated and maintained?

Table **E** also includes

1. A checklist are similar to Survey A-D. The checklist represents a less cumbersome way of collating the data. If the listed feature is present then the organization is ready in that respect, if it is not, then the organization has some work to do regarding readiness.
2. Recommendations derived from the literature. The recommendations closely reflect the features of contexts used to develop the tool in Figure 11. They represent possible benchmarks which can be used as guidelines after the tool has been administered. They are not a finding/outcome of the survey. See Appendix G for the citations related to the recommendations.

The Process: steps for determining e-learning readiness: The need for separate surveys.

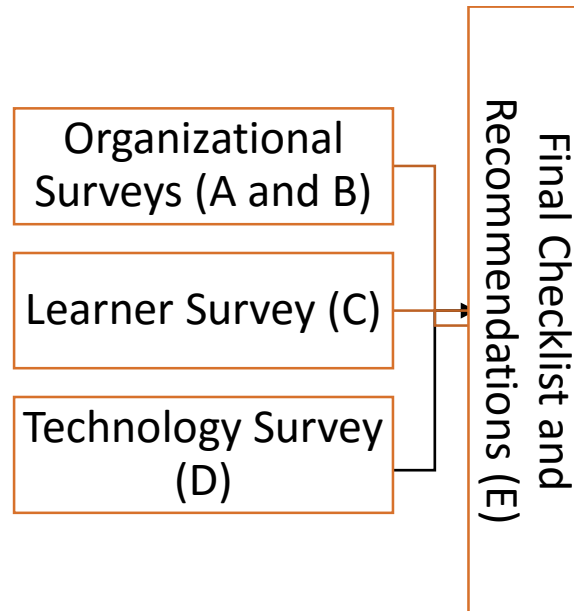
Using this tool is a two-step process.

Its various parts are targeted towards individual departments of the organization.

1. The four readiness analysis surveys will be administered to the relevant participants.
2. The answers to the questions in **E** are based on responses from the surveys **A-D** which are then collated and translated into information in **E**.
3. The recommendations serve as a baseline to determine level of readiness as well as provide ideas for improvements where e-learning has already been adopted.

Figure 12. Summarizes the sequence of using the e-learning readiness tool.

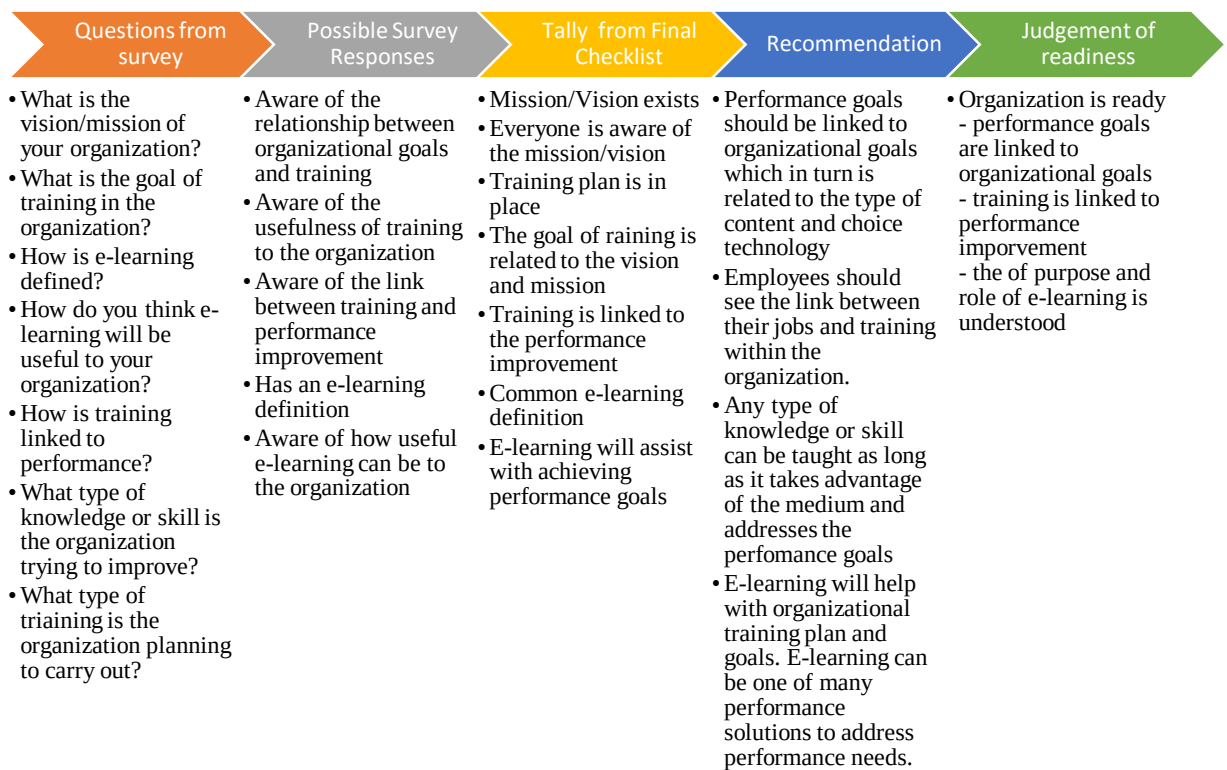
Figure 12. The process of using the E-learning analysis tool



Applying the e-learning readiness analysis tool: The figures 12, 13 and 14 below show examples of how the parts of the tool are connected in order to make a judgement on e-learning readiness.

1. The Questions- Represent a sample of questions from surveys A-D.
2. The Responses – Represent hypothetical responses from surveys A-D.
3. Final Checklist **E** - Uses condensed results from the surveys A-D
4. Recommendations – The recommendations are derived from the literature review and should help guide decisions about readiness for each category. See Appendix G.

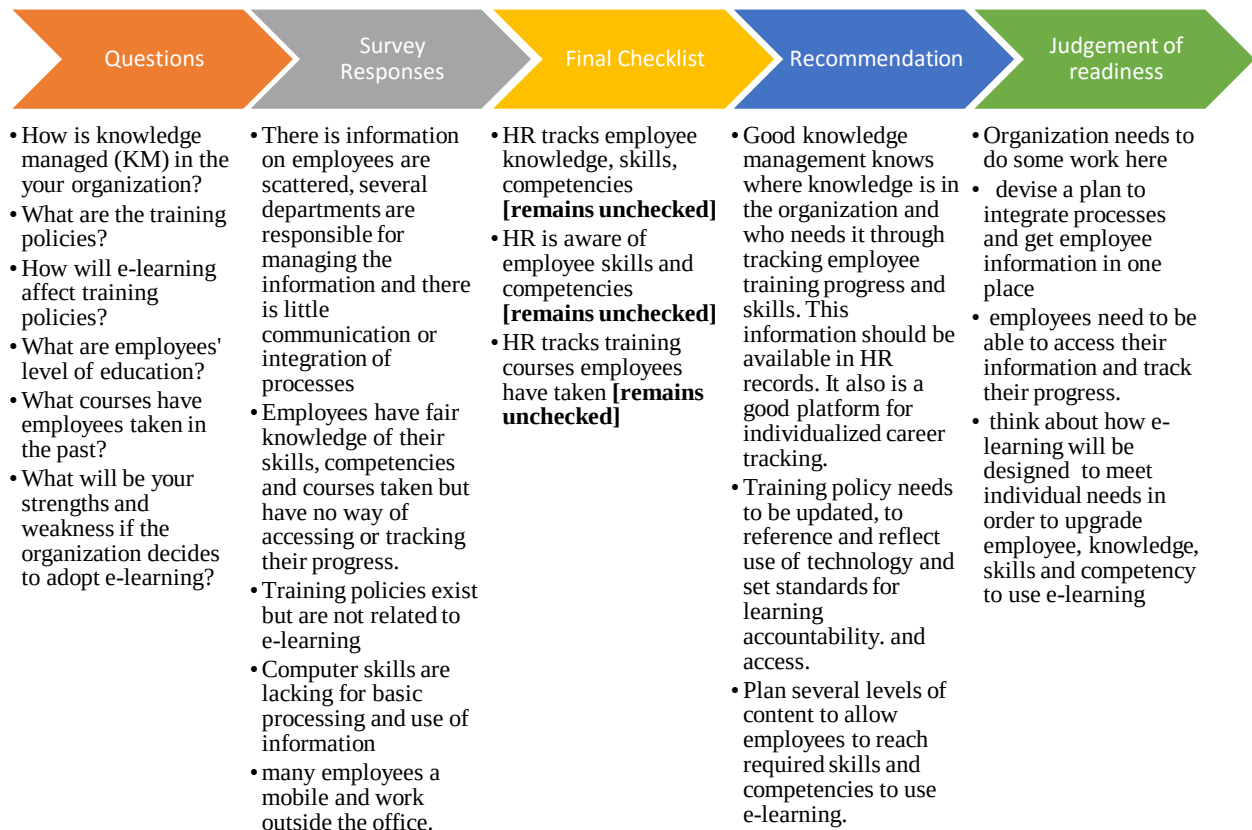
Figure 13: An example of use of the tool in judging organizational goals



- For example Figure 13. The survey questions all link to organizational goals. Each survey (A-D) has questions that are related to organizational goals. From the hypothetical responses it is possible to determine whether the stakeholders within the organization are knowledgeable about the links between organizational goals and performance expectations. Information tallied from the Surveys A-D is then used to fill **Table E**. Eventually, based on the responses, appropriate recommendations are given followed by a judgment of readiness for that category. The information from the checklist allows a quick evaluation. Figure 13. shows recommendations for readiness through links between organizational goal, performance goals and training goals. If there is no relationship between organizational goals, performance goals and

training goals this aspect of the organization needs to be revisited. If the organization has to be judged as ready then these three goals should be related.

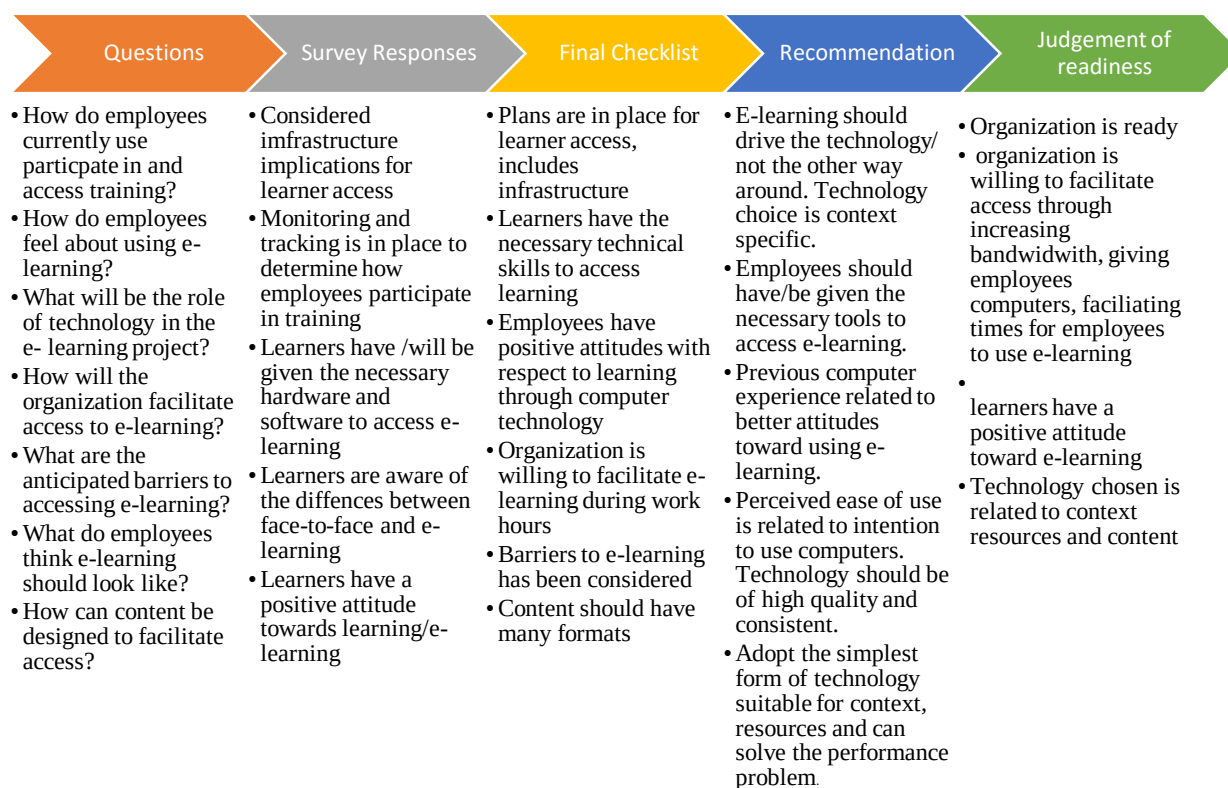
Figure 14: An example of the use of the e-learning readiness tool in judging knowledge management



- Figure 14. Looks at knowledge management (KM). This example illustrates how the tool can be used to judge whether this organization is ready in the category of knowledge management. The questions for this section focus on determining whether knowledge management exists, what information about employees is available and how this information can be translated into content design. This organization is not ready because processes are not in place to track employee information. The

information is not readily available to managers or employees. The literature recommendations are that good KM requires a process for tracking employee information. This can help inform how content can be designed to improve learner competency with relation to e-learning. In order for this organization to be ready it has to specify departmental responsibilities with respect to employee information and put processes in place for this to become accessible.

Figure 15: An example of the use of the e-learning readiness tool in judging technology access.



- Figure 15. Looks at technology access. Technology access is one of the most important aspects of e-learning readiness simply because if employees cannot access the instruction then the performance problem cannot be addressed. The questions focus on what exists, attitudes, the anticipated role of technology and how access will

be facilitated. Survey responses should include information on available infrastructure, learner competencies, attitudes and ideas about content design. The final checklist should collate the information in order to determine whether there is a plan for how and when learners will have access to e-learning, necessary attitudes are present and the impact the information will have on content design. The recommendations would include adoption of the simplest technology format that can give consistent quality. The organization can be deemed ready if there are positive attitudes, and willingness to make access possible.

Summary of the Chapter

This Chapter explains the rationale behind the design and development of the questions and the format used in the e-learning readiness tool. Questions were developed to capture information related to themes and features recognized in the literature. From the literature used it is apparent that e-learning remains a much customized endeavor. Many of the processes described are specific to the organizations. Some of the methods used cannot be generalized but the variation in scenarios helped identify situations which will facilitate successful use of the tool. The questions in the tool are generic in order for the tool to be applicable across organizations.

CHAPTER 5

EXPERT REVIEW

Introduction

In order to validate the e-learning readiness analysis tool created for this research, expert reviewers were recruited to review and share their opinions on the tool. There were two groups of expert reviewers: reviewers for content and reviewers for construct validity. All experts were contacted by e-mail. Content experts reviewed the tool to determine content validity. Reviewers checked the tool to determine whether the content was appropriate for determining e-learning readiness. Dr. Anthony Pina (Sullivan University) reviewed Survey C. Dr. Shahron Willams-Van Rooj (George Mason University) served as the expert for Survey A and B. Dr. Tonya Amankwatia (Regent University) reviewed Survey D. Content Reviewers are labeled Reviewer C1, C2 and C3 in the narrative. Since this tool hopes to bridge the gap between theoretical models and practical application the functionality of the tool was validated by three (3) instructional designers. They were, Dr. Lujean Baab (Virginia Tech), Dr. Camille Dickson-Deane (Montgomery County Community College) and Dena Coots (Alvin College). Construct reviewers are labelled Reviewer ID1, ID2 and ID3. Construct reviewers reviewed the entire tool. All expert reviewers were sent the tool along with semi structured interview questions (See Appendix H and I) by e-mail in advance of the interviews. During the interview experts gave feedback on several aspects of the tool. This feedback was collected and synthesized into themes which are discussed in this Chapter.

Themes from interviews

Appropriateness of Questions. The tool is made up almost entirely of questions, aimed at gathering information from several groups within the organization. Reviewers were expected to comment on the validity of the questions included. Generally reviewers thought that the questions used in the surveys were suitable for determining e-learning readiness.

Reviewer C1: “Overall I have found the questions to be very appropriate particularly in an industry setting if you are looking at an industry or a nonprofit perhaps a government entity and you are talking about training and employee.”

Reviewer C2: “I didn’t find any questions that were inappropriate or too invasive. Or questions that I think would not yield any useful data, all the questions were good. And I think that it provides some things that you can act upon.”

Reviewer C3 found that the tool covers all aspects of technology readiness. Reviewer C3 indicated that she had used several frameworks to review the questions, one of which being Ely’s (1990) eight conditions for successful implementation of technology. She stated that the questions provided good guidance for successful implementation of technology. This reviewer’s response confirmed the value of using Ely’s framework as the background in developing themes.

Reviewer C3: “I could tell you for the most part when I look at something like this the instrument can be helpful to me in my own work to see the planning of large scale technology implementation. To look at these things in terms of Ely his eight conditions for successful technology implementation and they definitely have application to e-learning. A lot of those things are still quite valuable and a lot of the things that you have here are definitely what I use.”

However, reviewers pointed out that some of the questions in some of the surveys may not be useful to the target group being interviewed. Some of the questions in the categories may not yield any responses from respondents because they do not have access to that type of information.

Reviewer C2: “Depending on the type of organization that you are talking to in the States at least we have publicly traded and privately traded organizations. In terms of finance you would have to find somebody to answer them a financial person. Privately traded companies they are not going to tell you that.”

Also some of the information in the individual surveys A- D may not be applicable to each of the groups. One group may not be as knowledgeable as the other in all of the categories.

Reviewer C3: “There are people who are part of the adoption process who may not know about finances. A lot of times when proposals do come costs are laid out before they reach the adoption committee.”

Reviewer C2 suggested that questions on surveys should be tailored to target interview groups since some questions may not be applicable to everyone.

Reviewer C2: “You need to split some of these questions to what you would ask a top level executive what you would ask them vs what you would ask say a director of the learning and development department. For example a top level executive will not necessarily have a role in past training initiatives and they may not know what the individual initiatives are whereas the director of training development would be able to answer that question easily.”

Reviewer ID1 suggested that some of the questions were too broad. As stated the questions may yield unusable information. For example, the question: What personnel will be

needed to design, develop, administer, manage, maintain and support delivery? This question needs to be broken down into two questions in order to get the information needed. The reviewer suggested: What personnel do you currently have in these areas? What personnel will you need in these areas? The questions need to be made more specific to prevent respondents from giving automatic responses.

Reviewer ID1: “the more clarity you have in the questions leaves enough room for individual responses. Because you want to get away from somebody who just goes and takes your survey and in 15 minutes checking randomly. You need to have individualized feedback to make sure they did not do a random check.

Reviewer C2 and Reviewer C3 suggested additional questions on concepts that were missed in the surveys. Reviewer C2, thought that the questions on informal learning should be added.

Reviewer C2: “One thing I don’t see in any of these is informal learning that an organization can encourage like communities of practice and webinars, learning shops lunch and learn”

Reviewer C3 thought it important to include self- efficacy questions for the Information Technology staff, since Information Technology staff assumed the role of support staff in many instances and their level of comfort with the new system becomes even more important because they are expected to have a grasp of “help desk questions”.

Reviewer C2 “It is important to pay attention to the people affected, the IT department people especially with something new.... You never decided what the IT person is comfortable with or what they know. So that a question that would give you a sense of efficacy.”

Surveys and Categories. The tool includes four surveys and several reviewers commented on the categories within the surveys. Reviewers found that all categories were relevant and agreed that the tool would serve as a good beginning for people starting out in e-learning. Reviewer C1 said “So some of my suggestions would be to kind of move items not necessarily change items.” Reviewer 2 suggested that the recommendations given in the tool are consistent with organizational literature and recognized that the category leadership support was a good addition to the tool. She also recommended that the survey be shorter for top executives since their time is limited.

Reviewer 2: “I think that there is some value from getting feedback from the executive suite but you may want to have a much shorter version of this or an interview and just ask a couple of questions about what their vision is of learning and how they feel about how things work in the organization at the moment so that gives you some context because the executives set the tone for the organization.”

Even though the categories were considered relevant, reviewers made several recommendations to improve the surveys by splitting up and adding categories where necessary. Reviewer 2 recommended splitting the leadership survey into two parts: the top executive and senior management. This observation matched the findings that definitions for leaders may vary in organizations as well as that there may be various tiers of leaders. The tool needs to capture variations that may exist in organizations.

In the learner analysis survey, Reviewer 1 found the main weakness was that questions related to learning culture were geared at two different outcomes but placed under one heading. Reviewer 1: “when you say how important is organizational learning to you? How would you define organizational learning?..... One is what is learning to the employee personally and the

other is what is learning to that organization.” He identified two categories, personal learning culture and organizational learning culture questions. He recommended adding a category that would allow differentiation of learning culture between organization and individual.

Reviewer ID1 discussed the possibility of using demographic data such as age and years with the company as an indicator of who would be willing to access e-learning. She suggested that this would add a new dimension to the research being carried out by identifying distinctive e-learning characteristics by age and service to the company.

Reviewer ID1: “You might find too that younger learners are more prone to individual learning and older in group learning. So those are some considerations. Whether or not they have to be a factor in it as long as they are mitigated through a good pool of questions a good pool of participants then I think you should be alright but it would be interesting to pull that data out by age range.”

Though this aspect was not added to the tool several articles speculated that there may be a relationship between age and acceptance of e-learning (Annansingh & Bright, 2010; Harfoushi et al., 2010). This information would help differentiate between demographics and willingness to adopt e-learning.

Two reviewers suggested that some of the categories may have too much information. There was concern for redundancy in some areas.

Reviewer ID3: “You don’t need all this information for each category. Not that they won’t have that information. How valuable is that information to the classification that you are ready or not ready?

Reviewer ID2: “: I do think it is a little overwhelming the amount of information but I also understand the need to be very through especially in your area B. I think that it is

possible especially in the human resource area, I think that there are some things that could be a little redundant that you can look back over and condense. I wouldn't take away any of your categories, by any means, I think that your categories are well organized and should stay"

These concerns for redundancy are related to the need to streamline questions within each survey so only questions that are suitable for each respondent be included in the survey. Moving questions around and removing those that are unnecessary for a particular survey would help reduce redundancy.

Reviewer ID2, found that the survey titles were too specific, since e-learning responsibilities varied from organization to organization.

Reviewer ID2: "Looks like you have a separate survey that would be delivered to different departments? Is that correct? In looking at it if I were to adopt that somewhere in my organization I think it makes assumptions on the different roles within organizations..... recognizing that all institutions have a lot of different ways in which they organize their structure it might be difficult to submit this to different departments for instance here you assume that this would go directly to an HR Department."

This observation can be supported by the case studies. (Borotis et al., 2005); Harfoushi et al. (2010) are two examples where the training and HR departments had different roles in relation to e-learning. Keeping generic titles will allow the surveys to be distributed to the correct group thereby receiving the appropriate feedback.

Labels and Terminology. Several of the reviewers commented on the terminology and labels used in the surveys and tables. Reviewer ID1 noted "Consistency in language, that's going

to help you very much. Some of it is just semantics”. Several terms were queried including suggestions to:

Use a broader term than employees to describe e-learning users.

Reviewer ID2: “And one of the terminologies you use in the technology section you ask when, where and will, employees use e-learning. That’s implying that e-learning is only for an employee. So if you want this to be global in my organization this would be involving students, it would involve employees, it would involve staff so just using the word employees, I don’t think is global enough to include everyone since you are talking about business, education a lot of different types of organizations. I would eliminate the word employee from there.”

Use resources as opposed to human resources.

Reviewer ID3: “The resources, I would have preferred you used resources as opposed to HR, but resources which is the people..... I would have preferred tools as opposed to technology.”

Replace training with a broader term to include all e-learning uses

Reviewer ID2: “Throughout the tool you used the word training, what type of training are you thinking of using e-learning for. That implies that e-learning is used not necessarily for course development but training limits your tool down to only thinking about e-learning for training purposes. But e-learning is so much more than just used for online training. So I wonder if there is a different terminology that might be broader. That would incorporate everything or even just broadly.”

Differentiate between access and use.

Reviewer ID3: “One big critique I have is that for technology you had access maintenance and integration. You did not have use. But somehow within the word access you somehow interpreted that to include use. So you have to be clear with that classification/ category there. Because having access to technology does not mean that you can use it.”

Change learning culture to indications of learning culture, since there would be difficulty with fully assessing culture with a few questions. Reviewer ID1: “I would call that indications of learning culture. And not the actual learning culture because you can assess indications of learning culture”

There was general consensus on the need to reduce the discipline specific terminology in the tool. This emerged from a concern that the terms may not be easily understood by people who are not in the instructional design field. Reviewer 2: “We know what knowledge management is as scholars, they don’t necessarily use those words in a business.”

Reviewer 3 suggested a glossary of terms for both implementers and survey respondents. This will help people not familiar with the terminology to understand what they are looking for. She stated “I was concerned about whether people will understand things that would be considered specialized knowledge, for example knowledge management, saying knowledge management could mean something different to other people”. Changing some of the terms will help clarify how they are used in the tool.

Guidelines for use. Each reviewer received guidelines in the interview package. The guidelines were meant to provide instructions for using the tool. Four of the six reviewers indicated that they were still not clear about how to use the tool before the interview. Reviewer ID3 said that “there are no instructions on how to use the tool. What you provided was an

analysis of how it would work. But you didn't provide the instructions on how to use it." The need for clearer directions was made more obvious when Reviewer ID1 asked "So, how would you utilize this tool? The tool would be question first and then follow up with the final checklist or is the checklist used by the person doing your review?" Initially the Reviewer ID2 was unclear about the target group and how to use the tool. She stated that "narrative was not clear enough about the role of parts A, B, C and D."

Reviewer ID3 commented on the need for clarity of terms not just for her as the reviewer but for people who were going to implement the tool, simply because it was important for them to be aware of what they were looking for as end products. Reviewer ID3 had difficulty getting a clear sense of what the final outcomes of the tool should be "I took the tool and I tried to complete it. I didn't know at the end what I was looking at. I didn't know if it measured anything and I was just like what I did not know what the purpose is. I think I am e-ready I guess." From these examples of confusion using the tool it was obvious that the accompanying instructions were unclear and needed improving. Any further iteration of the tool would have to include some guidelines and a glossary of terms.

Structure and organization. One of the primary goals of the tool was to be usable. The structure and sequencing was important in establishing usability. The tool included a checklist and recommendations to facilitate ease of use. All the reviewers agreed that the format was effective. The various surveys and the checklists helped the tool be an organized way of getting feedback. Several of the reviewers indicated that the parts fit logically together. They cover all the areas needed in determining readiness and provide a way of translating the data into usable information.

Reviewer ID2: “I think the format that you have for gathering it and putting the checkmarks in it and all makes it easier for the people who will be using it. Because the original survey questions may be especially overwhelming if somebody is looking at all of the tools, maybe an information overload. And so the way that you have it that the surveys feed into the checklist and all of that and it gives a good snap shot of what areas are strong and what areas need to drill down.”

Reviewer 1: “I think that’s the usefulness of the way you have it set up. It’s not just here is a survey and here is the results of the survey. You’ve got the questions you’ve got the responses, you’ve got the checklist and the recommendations and the judgement of readiness. I think that is what works the best because as you get closer to the end of that continuum the amount of actual physical information shrinks so that the person who is getting the judgement is just seeing a small subset, is seeing a summary of the information.

Reviewer ID1: “Overall I believe the tool does a very good job of giving the breadth and depth of information needed to determine readiness..... The tool covers all of the organizational elements very well, everything from the HR, to the IT to the learner overall organizational administration. And it does have a consistent checklist for all those elements to see if everyone is on the same page which is important.”

Reviewer ID3: “Overall the tool being organized the way it is covering the areas that it does and then to be analyzed and translated to a checklist in the **E’s** here that can be understood when you translate the score is a very good approach. I think it is structured very well.”

The checklist and recommendations give a roadmap of what to look for and a way of addressing readiness deficits.

Reviewer ID2: “Generally I think it is a very good tool. I think it is well organized. I think it addresses specific needs that need to be considered before anyone even begins to consider e-learning for an institution or organization. I like the final checklist of recommendations that you included at the end. So you have your basic collection of data and your E-1, E2, E3. I really like those final checklists and recommendations as well.”

Reviewer ID3: “The alignment of the questions and the checklist is very good. The checklist itself is very comprehensive and leads to a sense of e-learning readiness.”

The tool is holistic it covers the entire institution and stakeholders. The information in the tool is clearly disseminated. Readiness is viewed from many perspectives.

Reviewer ID2: “: I really like that the tool considers the institution as a whole it’s not fragmented into departments but it considers everything across the board. I like that it also considers your stakeholders and everyone who has an investment in the institution. That everything is addressed on the micro level.”

Reviewer ID3: “I like the organizational perspective. The resource perspective and then the tools perspective.”

The main criticism for the structure of the tool was its’ length. Reviewer ID3 stated “I would like the tool to be a little more succinct; its long and it seems intensive meaning that people may not want to complete it..... It’s long in the sense that I think there are areas that can be combined” Reviewer ID2 made a similar comment but stated that she understood the length was necessary since the information in the tool was gathered organization wide.

Overall the structure and sequencing of the tool was reviewed favorably. The checklists and recommendations were found to be useful for determining e-learning readiness. The length of the tool was of some concern to reviewers and researcher. The researcher asked about the length as one of the follow up questions out of concern for its ability to pose a barrier to use. If the suggestion to scale down some questions in the survey categories to prevent redundancy is followed, the length of the tool could be reduced considerably.

Weighting Scale. The question of the weighting scale was included in the interview questions since the researcher could not decide whether it would add value to the tool. Overall reviewers agreed that no weighting scale was required. Several reasons were given for not including the weighting scale. Several reviewers thought that a weighting scale would not add value to the tool since the tool gives all the necessary information.

Reviewer C2: “At this point I would not do a weighting scale because you still have to figure out what the interplay is between each of these things in your own context. Once you have done that then you can figure out whether or not a weighting scale is necessary. And really weighting scales may also fluctuate by type of organization. The checklist approach is much better at this point. I wouldn’t recommend a weighting scale.”

Reviewer C3. Well you inherently weighted these based on the number of assessment questions and the number of things you have in your checklist if you think about it. Yes, why are there 5 under leadership support and you might have two under something else. So you inherently in some ways have told me what you think is important or needs attention or needs to be teased out.

Reviewer ID 2. I really don’t think weighting is going to be necessary because I look at a tool like this and what is it going to do for me, it’s going to gather data, show me areas

where I need to improve where I need to think about a little more deeply. So I don't think weighting the different categories is going to be beneficial in the overall structure I don't think it's necessary here.

Reviewer ID3. A checklist is fine Yes I have it maybe I don't have it, no I don't have it. Yes I have it great you fine, No I don't have it well you need to improve it... If it is not yes it's no.

A weighting scale would not be required since this would make the tool more cumbersome than necessary.

Reviewer C1: "You know what honestly I think it might make things more complex than it necessarily needs to be because as I am looking at all of these it would be really difficult for me to weight which one is more important..... I think honestly I have seen lots of rubrics and lots of weighting scales sometime they just bring an extra level of complexity that this doesn't really need."

One reviewers suggested a scoring system as a way of indicating what needs to be improved and what does not, but not weighing one aspect more than the other. The scoring system would give a user a reporting mechanism which would allow them quantify the level of readiness.

Reviewer ID 1. I am not sure that any one of those outweighs without any of those key elements that you mentioned in your paper if one is missing you still can't move forward. Like a car with one flat tire you still can't drive. So I'm not sure that weighting any section is necessary. I think if you do go to a scoring, saying that a 100% says you are ready to roll, and you are at 80% let me tell you what areas are weak.

A weighting scale may appear in future versions of this tool but based on the suggestion of Reviewer C2 it is difficult to determine the value of any of the categories without actually implementing the tool. The concern with the scoring is trying to determine what each point would be worth, it presents similar difficulties to a weighting scale.

Summary of Expert Reviews

From the expert review, the strengths of the tool were seems to be the structure and organization. The reviewers commented positively about the level of organization, the checklists and recommendations. The format was found to be useable and effective in getting the information necessary to determine e-learning readiness in workplace settings. This indicated that the tool has been successful in meeting one of its main objectives: to produce a practical tool that gives an organizational view of e-learning readiness using information from various perspectives. The reviewers appreciated the use of several surveys to gather data related to organizational readiness. The content review experts found that the questions were appropriate for the categories although there were suggestions to separate some categories and reorganize others.

There were several weak areas cited by the reviewers including the need for clarity of accompanying instructions, difficulty of jargon used, and degree of breadth of some of the questions. Each of these would present difficulty for anyone using the tool. Some of the suggested changes were new ideas for the researcher for example; self-efficacy for Information Technology personnel. This is a useful addition for future iterations of the tool since most of the current literature is mostly concerned with learner self-efficacy. The concept of a personal learning culture was also new from the researcher's perspective and merits further investigation since the tool was designed primarily on the concept of organizational learning culture.

The guidelines enclosed in the interview package were supposed to provide directions for using the tool. However, although the guide showed how the tool could be used, it did not provide adequate directions. Consistently each reviewer indicated difficulty with initially determining how to use the tool. This aspect is particularly important since the tool is meant to assist in making it easier to assess e-learning readiness, but this can only be done if the tool is correctly used.

One of the foreseeable difficulties with making some of the recommended changes to the tool is the degree to which this will make the tool too specific. For example, one of the reviewers suggested breaking up the leader survey into two parts to target top executives and middle managers. There are many configurations of leadership and so breaking up this section of the tool may result in it being unrepresentative of particular types of organizations. The suggestion to remove the labels on the surveys is valid since, even from the literature review, it can be seen that the responsibilities of human resources and e-learning take several forms. This suggestion will actually broaden the application of the tool.

While the tool was designed to be as generic as possible, the researcher recognizes the eventual need for customizing to suit the organization in which the tool is to be administered. However care must be taken to maintain the generic nature of some aspects of the tool, given that the intention is to provide a tool that can be adapted to each environment in which it is to be used. It is difficult at this point to determine what future iterations of the tool will look like.

Future iterations of the tool. The tool was designed to be generic in terms of the information that it gathers. It is not focused on any particular software, format or solution. This is deliberate in an effort to design something that can easily be manipulated to suit the context in which it is being administered. For example, Reviewer C2 suggested splitting the leadership

survey into two parts to target to leaders in the organization and middle managers. This can be done in a different version of the tool if the organization does have the structure described. As the reviewer indicated, this perspective though significant, is not often gathered. Sections on learner culture will be added since these questions are related to adult learning theories of self-directed learning. The suggestion to add questions about information technology personnel and self-efficacy will also be included.

Since the tool is designed to be practically applied then, guidelines and glossaries will be added since the terminology and labels were of concern to reviewers. This would make the tool more user-friendly and easier to apply. This will also assist in getting more objective results from surveys if everyone is using the same terminology. The tool will also be streamlined for the two reasons suggested by reviewers, to make questions more applicable to participants and less redundant. This will also make the tool shorter since and address concerns about the length.

It is therefore expected that future iterations of the tool will look somewhat different from this version. Just as e-learning is designed to suit the environment in which it is adopted, the tool may look different for each organization in which it is used.

CHAPTER 6

DISCUSSION AND CONCLUSIONS

Discussion

The purpose of this study was to design and develop a tool for determining e-learning readiness in organizations. In order to answer the research question it was necessary to: identify the factors relevant to e-learning readiness, identify the features of the tool and determine the sequence of steps required to use the tool.

Van den Akker et al. (2012) state that the purpose of design and development research is to improve the quality of an intervention with an aim to be applied practically. Tool research requires careful documentation of four phases of the ADDIE process; analysis, design, development and evaluation (Richey & Klein, 2007). The analysis phase involved a literature review to determine the factors affecting e-learning readiness which were included in the tool. This was followed by the design and development phases which determined the features and sequencing of the tool. The evaluation phase was conducted through expert validation of the tool. This tool was developed as a way for practitioners assess organizational readiness for e-learning.

The structure and processes described in the development of this tool share characteristics of both tool and model design and development research. In tool design, research is focused on a specific tool design and development project, with analysis of the conditions for use. Tool research is usually context specific (Richey & Klein, 2007). The tool designed in this project is intended to be generalizable, a feature of model research. The methodology used in the design of the tool is slightly different from the usual methodology used in tool research which is usually case study (Richey & Klein, 2007). Formative research requires less structured methodologies. The descriptions of the design and development research are to serve as examples so that users can determine how tools can be applied to their contexts (Van den Akker et al., 2012). In this

research the e-learning literature is used to get an indication of the contexts in which e-learning was applied. The tool is designed to be used in organizations planning to use e-learning but the characteristics of these organizations may vary.

One of the areas of interest of product and tool developers is the process involved in designing (Richey & Klein, 2007). Richey and Klein (2007) provide a comprehensive overview of design and development research as related to tool design, but fail to detail an actual guidelines for conducting tool design and development research. In this research, procedures indicated in the design and development phases of Ellis & Levy (2010; Nunamaker et al. (1990) were used to supplement Richey and Klein (2007). The design and development phases of Ellis & Levy, 2010; Nunamaker et al., 1990 are based in information systems tool design approaches and were applied to these instructional design processes. The processes of Ellis & Levy (2010; Nunamaker et al.(1990) were integrated into the phases of ADDIE used in this research. For example, determining a conceptual framework through literature review is part of the design and development process in Ellis and Levy (2010). In this research the literature review spans both the analysis phase and design phases. The lesson learned from this research process, suggests that there is need for what Nelson (2013) refers to as “Research about design”, in order to develop clearer guidelines for tool and product design.

Despite these differences in methodologies, the end result of developmental research is always an artifact (Ellis & Levy, 2010). The literature review revealed several factors that were necessary for e-learning readiness. Tool research involves identifying issues that are relevant for successful application of the tool (Richey & Klein, 2007). The factors represent examples of essential conditions for determining readiness and were included as categories in the tool. The categories guiding the questions developed were validated by Reviewers, who made direct

reference to the categories being aligned with accepted literature. Several of the factors identified were interconnected.

The interrelatedness of the factors made them difficult to unravel and place into distinct categories. This type of dilemma is in line with the difficulties faced by design and development research where several variables are addressed at the same time (Van den Akker et al., 2012; Richey & Klein, 2007). This why the tool is designed to collate participant responses in Table E which provides a usable format for reporting information at an organizational level. The tool design shows that there are many relationships existing in organizations that are relevant to e-learning readiness, for example, the organizational support systems directly impact the learners and content design. The three cannot be studied in isolation.

The questions were created to be generic, particularly in an area where technological changes occur quickly. Through evaluation of other tools it was clear that specific questions particularly with respect to technology quickly becomes outdated. The relationship between surveys A-D and Table E are significant since, as suggested by one reviewer, too much data can become cumbersome and unusable.

Evaluation is necessary to determine whether the “artifact developed meets the functionalities and requirements established for it during the design and development phase” (Ellis & Levy, 2010, p. 113). The reviewers validated the constructs of the tool, in terms of effectiveness. The structure of the tool provides an audit trail for the information gathered in the tool, making it more practical. The tool, through its sequence and use of categories, moves conceptual ideas to practical application.

Through the literature review, it was observed that many of the general factors affecting e-learning readiness remained the same over time. For example, leadership roles, resistance to e-

learning compared to face-to face, and access to technology were barriers which persisted in the literature from the late 90's to more current publications. It was believed that there may be a change in barriers as time went by but this was not the case. The technology facilitates instructional delivery but people and their performance are driving forces behind e-learning (Tai, 2007). Given that change takes place slowly due to human nature, it is understandable why these factors remain challenges for e-learning. Although technology is a necessary aspect of e-learning readiness, it is not the predominant focus since contrary to earlier schools of thought, it is only as effective as the performance goal for which it is used. The challenge of this tool design was to capture the unique perspective of e-learning readiness in this age. Though some of the factors may be the same, the themes and categories focus more closely on the relationships existing between these categories and the organizational support structures, learner concerns and content design.

Contributions of study to the field

The general goal of instructional design is to improve practice (Richey et al., 2011). This tool is designed to serve as a guide to practitioners in organizations thinking of adopting e-learning. As design and development research, this research contributes several to several areas of the field. It provides an alternate analysis tool to those described in HPT and ISD. It is an analysis specific to determining the parameters associated with e-learning. It provides a systematic process for determining organizational e-learning readiness and operationalizes the factors initially identified in existing e-learning models. The results of the e-learning analysis can provide a guide to adoption decisions.

Although the e- learning readiness analysis aims to gather similar types of information as existing analysis tools such as learner needs and context of instruction, the environment in which

e-learning will take place is decisively different. The e-learning environment introduces new variables. The technology enabled nature of e-learning extends on Tessmer (1990) environmental analysis. It not only explores the impact of the instructional environment in physical learning spaces, such as those used in face-to-face instruction, but also analyzes the ways in which the virtual environment impacts the organizations ability to use e-learning.

In the design and development phases, a tool was created that can used in the in real world situations. The tool provides a systematic process for determining e-learning readiness. Instructional design aims to find out about learner backgrounds, learning contexts and their relationship to content design (Richey et al., 2011). This tool collects data related to finding out a similar type of information in various surveys. When evaluated, they can impact decisions on an organizational level that eventually influence content design decisions at an instructional level.

Study Limitations

The limitations of this study are related to the variability that exists with e-learning. The inconsistencies in defining e-learning and its place in organizations may have caused some literature to be overlooked. The usability and practicality of the tool cannot be guaranteed by this study, since it has not been tested in the field. Organizations vary in many ways and so the application of the tool would have to fit the specific environment in which it is going to use. Since the analysis phase was a literature review, much of the data gathered is dependent on the authors' description. In an attempt to be broad, context specific indicators may have been left out. Since design and development research is an iterative process, the tool will continue to change (Richey & Klein, 2007).

Recommendations for future application

In order to further validate the tool, it needs to be field tested (Ellis & Levy, 2010; Richey & Klein, 2007). Field testing would represent the implementation stage of the instructional design process. It is also a way of gathering further feedback from potential users about the effectiveness and practicality of the tool (Van den Akker et al., 2012). Since the tool is designed to be used in a variety of organizations, further research that is more context specific would expand on the assumption of generalizability for which it was built. Implementation in a variety of settings will also help identify any constraints that may develop with application. Additional testing and studies would enhance the fields of e-learning, human performance and instructional design.

Conclusion

Tool research gives extensive descriptions of the analysis, design and development process and are largely tied to a particular context. This research follows this process. However, this tool is not context specific. It represents a mix between tool and model research as described by Richey and Klein (2007). The methodology is different from previous approaches to tool design and development research as its context information is drawn from e-learning studies. This aligns with the nature of design and development research which has many variations in structure.

The tool builds on factors identified in existing conceptual models, Aydin and Tasci (2005); Chapnick (2005); Borotis and Poulymenakou (2005) and Psycharis (2005), by outlining a process for determining e-learning readiness. It provides a practical way for determining e-learning readiness through its checklists. The checklists provide a simple way for compiling and verifying data. The tool is participatory, meaning that data is collected from many perspectives

within the organization. The tool can be applied by practitioners in organizations thinking of setting up e-learning programs, by translating conceptual into applied. The tool not only describes a process for determining e-learning readiness but also presents a way for factors to be linked. It translates what is essentially theoretical in to something that can be used in practical situations. This tool is an additional readiness measure which can be applied to different types of organizations.

REFERENCES

- Abdon, B., Raab, R., & Ninomiya, S. (2008). eLearning for international agriculture development: dealing with challenges. *International Journal of Education and Development using Information and Communication Technology*, 4(1), 80-94.
- Adams, J., & Morgan, G. (2007). "Second generation" e-learning: Characteristics and design principles for supporting management soft-skills development. *International Journal on E-Learning*, 6(2), 157-185.
- Admiraal, W., & Lockhorst, D. (2009). E-Learning in small and medium-sized enterprises across Europe attitudes towards technology, learning and training. *International Small Business Journal*, 27(6), 743-767.
- Ali, G. E., & Magalhaes, R. (2008). Barriers to implementing e-learning: a Kuwaiti case study. *International Journal of Training and Development*, 12(1), 36-53.
- Allen, M. W. (2008). Designing outside the box. *Training and Development*, 62(2), 30-33.
- Annansingh, F., & Bright, A. (2010). Exploring barriers to effective e-learning: case study of DNPA. *Interactive Technology and Smart Education*, 7(1), 55-65.
- Argyris, C., & Schon, D. A. (1996). *Organizational learning II: Theory, method and practice*. Reading, Mass: Addison-Wesley.
- Aydın, C. H., & Tasci, D. (2005). Measuring Readiness for e-Learning: Reflections from an emerging country. *Journal of Educational Technology & Society*, 8(4), 244-257.
- Bahlis, J., Eng, P., & Tourville, S. J. (2004). *Where training resources should be allocated*. Paper presented at Interservice/Industry Training, Simulation, and Education Conference (I/ITSEC). Florida.
- Barrow, C. (2003). *E-Training and Development*. Hoboken, NJ: John Wiley & Sons.

- Becker, K., Newton, C., & Sawang, S. (2013). A learner perspective on barriers to e-learning. *Australian Journal of Adult Learning*, 53(2), 211-233.
- Berge, Z. L. (2007). Training in the corporate sector. In M.G. Moore (Ed.), *Handbook of distance education* (2nd ed., pp.515-529). Mahwah, NJ: L. Erlbaum Associates.
- Blackler, F. (2002). Knowledge, knowledge work and organizations. Knowledge, knowledge work and organizations: An overview and interpretation. *Organization Studies*, 16(6), 1021-1046. doi:10.1177/017084069501600605
- Borotis, S., & Poulymenakou, A. (2004). E-learning readiness components: Key issues to consider before adopting e-learning interventions. In Richards (Ed.), *Proceedings of E-learn 2005: World Conference on E-Learning in Corporate, Government, Healthcare, and Higher Education* (pp.16622-1629). Washington, DC.
- Borotis, S., Poulymenakou, A. K., & Karamanis, V. A. (2005). *Embedding eLearning in Corporate Training: Lessons from a Case Study*. In Uskov (Ed.), *Proceedings of Web-Based Education: The Fourth IASTED International Conference* (pp. 461-171). Grindelwal: Switzerland.
- Brown, J. S., Collins, A., & Duguid, P. (1989). Situated cognition and the culture of learning. *Educational Researcher*, 18(1), 32-42.
- Burgess, J. R., & Russell, J. E. (2003). The effectiveness of distance learning initiatives in organizations. *Journal of Vocational Behavior*, 63(2), 289-303.
- Cercone, K. (2008). Characteristics of adult learners with implications for online learning design. *AACE Journal*, 16(2), 137-159.

- Chan, S. C., & Ngai, E. W. (2007). A qualitative study of information technology adoption: How ten organizations adopted Web-based training. *Information Systems Journal*, 17(3), 289-315.
- Chapnick, S. (2000). *Needs Assessment for E-Learning*. Alexandria VA: ASTD.
- Charmaz, K. (2014). *Constructing grounded theory* (2nd ed.). Thousand Oaks, California: Sage.
- Chawhan, A. K. (2012). Knowledge Management and E-learning. *CSI Communications*, 36(3), 10-11.
- Chen, E. T. (2008). Successful e-learning in corporations. *Communications of the IIMA*, 8(2), 45-54.
- Chong, B., Martinsons, M. G., & Wong, M. (2004). Adoption of e-learning for work-based training: an exploratory study of the Hong Kong apparel industry. *International journal of innovation and learning*, 1(3), 312-326.
- Chuang, C.-K., Chang, M., Wang, C.-Y., Chung, W.-C., & Chen, G.-D. (2008). Application of E-Learning to Pilot Training at TransAsia Airways in Taiwan. *International Journal on E-Learning*, 7(1), 23-39.
- Chute, A. G., Hancock, B., & Thompson, M. (1999). *The McGraw-Hill Handbook of Distance Learning*. New York, NY: McGraw-Hill.
- Clark, R. C., & Mayer, R. E. (2011). *E-learning and the science of instruction: Proven guidelines for consumers and designers of multimedia learning*. Hoboken, NJ: John Wiley & Sons.
- Comacchio, A., & Scapolan, A. (2004). The adoption process of corporate e-learning in Italy. *Education+ Training*, 46(6/7), 315-325.

- Corbin, & Strauss, A. (2008). *8 Analyzing Data for Concepts. Basics of Qualitative Research (3rd ed.): Techniques and Procedures for Developing Grounded Theory*. SAGE Publications, Inc. Thousand Oaks, CA: SAGE Publications, Inc.
- Creswell, J. W. (2013). *Research design: Qualitative, quantitative, and mixed methods approaches* (3rd ed.). Thousand Oaks: California: Sage publications.
- Dabbagh, N. (2007). The online learner: Characteristics and pedagogical implications. *Contemporary Issues in Technology and Teacher Education*, 7(3), 217-226.
- Dai, Z., & Duserick, F. G. (2007). An Empirical Study of E-learning for Improving Value-Chain Activities. *Competition Forum*, 5(1), 260-264.
- Davis, F. D. (1989). Perceived Usefulness, Perceived Ease of Use, and User Acceptance of Information Technology. *MIS Quarterly*, 13(3), 319-340. doi:10.2307/249008
- Deeny, E. (2003). Calculating the real value of e-learning. *Industrial and Commercial Training*, 35(2), 70-72.
- Derouin, R. E., Fritzsche, B. A., & Salas, E. (2005). E-learning in organizations. *Journal of Management*, 31(6), 920-940.
- Dick, W., Carey, L., & Carey, J. O. (2005). *The systematic design of instruction* (6th ed.). Boston, MA: Pearson/Allyn and Bacon.
- Edelson, D. C. (2006). Balancing innovation and risk. In J. van de Van den Akker, K. Gravemeijer, & N. Nieveen (Eds.), *Educational Design Research* (pp. 100 -106). Madison Ave, New York: Routledge.
- Ellis, T. J., & Levy, Y. (2010). A guide for novice researchers: Design and development research methods. In E. Cohen (Ed.), *Proceedings of Informing Science & IT Education Conference, InSITE* (pp.108-118). Cassino:Italy

- Ely, D. P. (1990). Conditions that facilitate the implementation of educational technology innovations. *Journal of Research on Computing in Education*, 23(2), 298-305.
doi:10.1080/08886504.1990.10781963
- Engeström, Y., Kerosuo, H., Netteland, G., Wasson, B., & Mørch, A. I. (2007). E-learning in a large organization. *Journal of Workplace Learning*, 19(6), 392-411.
doi:doi:10.1108/13665620710777129
- Ettinger, A., & Holton, V. (2005). E-learning lessons from the sharp end: the BBC. *Training & Management Development Methods*, 19(2), 6.07-06.12.
- Fayyoubi, A., & Monteroni, V. P. (2009). The effectiveness of e-learning: Academic and business comparison. *Turkish Online Journal of Distance Education*, 10(1), 130-140.
- Fister, S. G. (2002). Measuring the ROI of e-learning. *Workforce*, 81(8), 74-77.
- Floyd, T. (2003). Analyzing the organization's need for e-learning. In G. M. Piskurich (Ed.), *Preparing learners for e-learning* (pp. 37-70). NewYork: American Management Association International.
- Franklin, M. (2006). *Performance gap analysis: Tips, tools, and intelligence for trainers*. Alexandria, VA: American Society for Training and Development.
- Galloway, D. L. (2005). Evaluating distance delivery and e-learning is kirkpatrick's model relevant?. *Performance Improvement*, 44(4), 21-27. doi:10.1002/pfi.4140440407
- Garvin, D. A., Edmondson, A. C., & Gino, F. (2008). Is yours a learning organization? *Harvard business review*, 86(3), 109.
- Gilbert, T. F. (1978). Human competence—engineering worthy performance. *NSPI journal*, 17(9), 19-27.

- General Motors University. (2005). *Planning, implementing, & evaluating e-Learning: General Motors University case study*. Houston, Texas: American Productivity & Quality Center.
- Guglielmino, L. M., & Guglielmino, P. J. (2003). Identifying learners who are ready for e-learning and supporting their success. In G. M. Piskurich (Ed.), *Preparing learners for e-learning* (pp. 19-34). New York: American Management Association International.
- Guglielmino, P. J., & Guglielmino, L. M. (2003). Are your learners ready for e-learning? In G.M. Piskurich. *The AMA handbook of e-learning: Effective design, implementation, and technology solutions*. (pp. 87-98). New York, NY: American Management Association International.
- Gustafson, K. L., & Branch, R. M. (1997). Revisioning models of instructional development. *Educational technology research and development*, 45(3), 73-89.
- Hall, B. (2002). Six steps to developing a successful e-learning initiative: Excerpts from the e-learning guidebook. *The ASTD E-Learning Handbook: Best Practices, Strategies, and Case Studies for an Emerging Field*. New York, NY: McGraw-Hill.
- Hamini, T. M. (2008). Evaluating e-learning programs: an adaptation of Kirkpatrick's model to accommodate e-learning environments. *Journal of Computer Science*, 4(8), 693-698.
- Haney, B. D. (2002). Assessing organizational readiness for E-learning: 70 questions to ask. *Performance Improvement*, 41(4), 10-15.
- Harfoushi, O. K., Obiedat, R. F., & Khasawneh, S. S. (2010). E-Learning Adoption inside Jordanian Organizations from Change Management Perspective. *International Journal of Emerging Technologies in Learning*, 5(2), 49-60. doi:10.3991/ijet.v5i2.1260
- Harless, J. H. (1987). An analysis of front-end analysis. *Performance + Instruction*, 26(2), 7-9. doi:10.1002/pfi.4160260204

- Ho, C.-L., & Dzeng, R.-J. (2010). Construction safety training via e-Learning: Learning effectiveness and user satisfaction. *Computers & Education*, 55(2), 858-867.
- Howard, B. (1998). Increasing employee knowledge and understanding of operational systems: integrating multiple technologies at NYNEX. In D. A. Schreiber & Z. L. Berge (Ed), *Distance Training: how innovative organizations are using technology to maximize learning and meet business objectives* (1st ed., pp. 92-114). San Francisco, California: Jossey-Bass.
- Hung, S.-Y., Chen, C. C., & Lee, W.-J. (2009). Moving hospitals toward e-learning adoption: an empirical investigation. *Journal of Organizational Change Management*, 22(3), 239-256.
- IBM. (2005). *Planning, implementing, & evaluating e-Learning initiatives: IBM case study*. Houston, Texas: American Productivity & Quality Center.
- Kaur, K. (2004). *An assessment of e-learning readiness at the Open University Malaysia*. Paper presented at the International Conference on Computers in Education, Melbourne Australia.
- Kearns, S. K. (2010). *e-Learning in Aviation*. Surrey, England: Ashgate Publishing, Ltd.
- Keramati, A., Afshari-Mofrad, M., & Kamrani, A. (2011). The role of readiness factors in E-learning outcomes: An empirical study. *Computers & Education*, 57(3), 1919-1929.
- Khan, B. H. (2005). *Managing e-learning: Design, delivery, implementation, and evaluation*. Hershey, PA: Information Science Publishing.
- Kirkpatrick, D. L. (2005). *Evaluating training programs*. New York, NY: McGraw-Hill Education.
- Knowles, M. (1978). *The adult learner: a neglected species* (2nd ed.). Houston, Texas: Gulf Publishing Company.

- Knowles, M. S., Holton, E. F., & Swanson, R. A. (1998). *The adult learner: the definitive classic in adult education and human resource development* (5th ed.). Houston, Texas: Gulf Publishing Company
- Kotter, J. P. (2008). *Corporate culture and performance*. New York, NY: Simon and Schuster.
- Lave, J., & Wenger, E. (1991). *Situated learning: Legitimate peripheral participation*: Cambridge, England: Cambridge University Press.
- Lee, Y.-H., Hsieh, Y.-C., & Hsu, C.-N. (2011). Adding Innovation Diffusion Theory to the Technology Acceptance Model: Supporting Employees' Intentions to use E-Learning Systems. *Educational Technology & Society*, 14(4), 124-137.
- Lim, H., Lee, S.-G., & Nam, K. (2007). Validating E-learning factors affecting training effectiveness. *International Journal of Information Management*, 27(1), 22-35.
doi:10.1016/j.ijinfomgt.2006.08.002
- Lockee, B. B., Burton, J. K., & Cross, L. H. (1999). No comparison: Distance education finds a new use for 'no significant difference'. *Educational technology research and development*, 47(3), 33-42.
- McKee, C., & Cribb, A. (2006). Lifelong Learning. *Training and Development*. 60 (10). 52-54.
- Miller, L. (2013). ASTD 2013 State of the Industry. *Workplace Learning*. 67(11), 41-45.
- Moshinskie, J. (2003). Organizational best practices for preparing e-learners. In G. M. Piskurich (Ed.), *Preparing learners for e-learning* (pp. 91-100). Hoboken, New Jersey: Jossey-Bass/Pfeiffer.
- Nakayama, M., Proano, R., Pilla, B., & Silveira, R. (2005). The Impact of the Implementation of Distance Education Systems in a Telecommunications Company. In P. Nicholson, M.

- Ruohonen, J. B. Thompson, & J. Multisilta (Eds.), *E-Training Practices for Professional Organizations* (pp. 163-170). Boston, MA: Springer US. doi:10.1007/0-387-23572-8_20
- Needle, D. (2010). *Business in context: An introduction to business and its environment*. Independence, KY: Cengage Learning.
- Nelson, W. A. (2013). Design, research, and design research: Synergies and contradictions. *Educational Technology*, 53(1), 3-11.
- Newton, R., & Doonga, N. (2007). Corporate e-learning: Justification for implementation and evaluation of benefits. A study examining the views of training managers and training providers. *Education for Information*, 25(2), 111-130.
- Nieveen, N., & Gustafson, K. (1999). Characteristics of computer-based tools for education and training development: In J.J. Van de Akker (Ed.), *Design approaches and tools in education and training* (pp. 155-174). Boston, MA: Kluwer Academic Publishers.
- Nonaka, I., & Takeuchi, H. (1995). *The knowledge-creating company: how Japanese companies create the dynamics of innovation*. New York, NY: Oxford University Press.
- Nunamaker Jr, J. F., Chen, M., & Purdin, T. D. (1990). Systems development in information systems research. *Journal of Management Information Systems*, 7(3), 89-106.
- Omoda-Onyait, G., & Lubega, J. (2011). E-learning Readiness Assessment Model: A Case Study of Higher Institutions of Learning in Uganda. In R. Kwan, J. Fong, L.-f. Kwok, & J. Lam (Eds.), *Hybrid Learning* (pp. 200-211). Heidelberg, Berlin: Springer.
- Örtenblad, A. (2001). On differences between organizational learning and learning organization. *The learning organization*, 8(3), 125-133.
- Ozturan, M., & Kutlu, B. (2010). Employee satisfaction of corporate e-training programs. *Procedia-Social and Behavioral Sciences*, 2(2), 5561-5565.

- Piskurich, G. M. (2004). *Preparing learners for e-learning*. Hoboken, NJ: John Wiley & Sons.
- Piskurich, G. M., & Association, A. M. (2003). *The AMA handbook of e-learning: Effective design, implementation, and technology solutions*. New York, NY: Amacom.
- Prensky, M. (2001). Digital natives, digital immigrants part 1. *On the Horizon*, 9(5), 1-6.
- Proctor & Gamble. (2005). *Planning, implementing, & evaluating e-Learning initiatives: Proctor & Gamble case study*. Houston, TX: American Productivity & Quality Center.
- Psycharis, S. (2005). Presumptions and action affecting an e-learning adoption by the educational system. Implementation using virtual private networks. *European Journal of Open and Distance Learning*, 2, 1-10.
- Purnomo, S., Lee, YH. . (2013). E-learning adoption in the banking workplace in indonesia: An empirical study. *Information Development*, 29(2), 138-153.
doi:10.1177/0266666912448258
- Ramayah, T., Ahmad, N. H., & Hong, T. S. (2012). An assessment of e-training effectiveness in multinational companies in Malaysia. *Educational Technology & Society*, 15(2), 125-137.
- Raymond, L., Bergeron, F., & Blili, S. (2005). The assimilation of e-business in manufacturing SMEs: Determinants and effects on growth and internationalization. *Electronic Markets*, 15(2), 106-118.
- Richey, R., & Klein, J. D. (2007). *Design and development research: Methods, strategies, and issues*. New York, NY: Routledge.
- Richey, R., Klein, J. D., & Tracey, M. W. (2011). *The instructional design knowledge base: Theory, research, and practice*. New York, NY: Routledge.

- Richey, R. C., Klein, J. D., & Nelson, W. A. (2004). Developmental research: Studies of instructional design and development. *Handbook of research on educational communications and technology* (2nd ed., pp. 1099-1130). Mahwah, NJ: Lawrence Erlbaum
- Roca, J. C., & Gagné, M. (2008). Understanding e-learning continuance intention in the workplace: A self-determination theory perspective. *Computers in Human Behavior*, 24(4), 1585-1604. doi:<http://dx.doi.org/10.1016/j.chb.2007.06.001>
- Roffe, I. (2002). E-learning: engagement, enhancement and execution. *Quality Assurance in Education*, 10(1), 40-50.
- Rogers, E. M. (2003). *Diffusion of innovations* (5th ed.). New York, NY: Simon and Schuster.
- Rosenberg, M. J. (2001). *E-learning: Strategies for delivering knowledge in the digital age*. New York, NY: McGraw-Hill
- Rosenberg, M. J. (2007). *Beyond e-learning*. San Francisco: Pfeiffer
- Rothwell, W. J., & Kazanas, H. C. (2011). *Mastering the instructional design process: A systematic approach*. Hoboken, NJ: John Wiley & Sons.
- Schreurs, J., Sammour, G., & Ehlers, U. (2008). ERA-E-Learning Readiness Analysis: A eHealth Case Study of E-Learning Readiness. In M.D. Lytras, J.M. Carroll, E. Damiani, R. D. Tennyson, D. Avison, G. Vossen & P. Ordonez De Pablos (Eds.), *The Open Knowledge Society. A Computer Science and Information Systems Manifesto* (pp. 267-275). Berlin, Heidelberg: Springer.
- Schweizer, H. (2004). E-learning in business. *Journal of Management Education*, 28(6), 674-692.

- Senge , P. (1990). The fifth discipline. *The Art & Practice of Learning Organization*. Currence, New York: Doupleday.
- Sharma, K. (2011). Financial implications of implementing an e-learning project. *Journal of European Industrial Training*, 35(7), 658-686.
- Simmons, D. E. (2002). The forum report: E-learning adoption rates and barriers. In A. Rossett (Ed.), *The ASTD e-learning handbook* (pp.19-23). New York, NY: McGraw-Hill.
- Singleton, R. A., Straits, B. C., & Straits, M. M. (1993). *Approaches to social research*. (3rd ed.) New York, NY: Oxford University Press.
- Steenekamp, K., Botha, G., & Moloi, K. C. (2012). Sustaining change in a learning organization. *Africa Education Review*, 9(2), 380-394. doi:10.1080/18146627.2012.722389
- Strother, J. B. (2002). An assessment of the effectiveness of e-learning in corporate training programs. *The International Review of Research in Open and Distance Learning*, 3(1). 1-17.
- Swinney, J. M. (2007). One more time: What training is— and isn't. *Performance improvement*, 46(5), 6-9. doi:10.1002/pfi.127
- Tai, L. (2007). *Corporate E-Learning: An inside view of IBMs solutions*. New York, NY: Oxford University Press.
- Tessmer, M. (1990). Environment analysis: A neglected stage of instructional design. *Educational technology research and development*, 38(1), 55-64.
- Tessmer, M. (1994). Formative evaluation alternatives. *Performance Improvement Quarterly*, 7(1), 3-18.
- Tessmer, M., & Wedman, J. F. (1992). Decision-making factors and principles for selecting a layer of instructional development activities. *Performance+ Instruction*, 31(4), 1-6.

- Van den Akker, J. V. d., Branch, R. M., Gustafson, K., Nieveen, N., & Plomp, T. (2012). *Design approaches and tools in education and training*. New York, NY: Springer Publishing Company, Incorporated.
- Van Tiem, D. M., Moseley, J. L., & Dessinger, J. C. (2000). *Fundamentals of performance technology: a guide to improving people process and performance*. Washington, DC: International Society for Performance Improvement.
- Visscher-Voerman, I., & Gustafson, K. L. (2004). Paradigms in the theory and practice of education and training design. *Educational technology research and development*, 52(2), 69-89.
- Waight, C. L., & Stewart, B. L. (2005). Valuing the Adult Learner in E-Learning: Part One--A Conceptual Model for Corporate Settings. *Journal of Workplace Learning*, 17(5), 337-345.
- Waight, C. L., & Stewart, B. L. (2005a). Valuing the adult learner in e-learning: part one - a conceptual model for corporate settings. *Journal of Workplace Learning*, 17(5/6), 337-345. doi:10.1108/13665620510606751
- Waight, C. L., & Stewart, B. L. (2005b). Valuing the adult learner in e-learning: part two - insights from four companies. *Journal of Workplace Learning*, 17(5/6), 398-414. doi:10.1108/13665620510606805
- Wang, Y.-S., Wang, H.-Y., & Shee, D. Y. (2007). Measuring e-learning systems success in an organizational context: Scale development and validation. *Computers in Human Behavior*, 23(4), 1792-1808.
- Watkins, R. (2014). Twenty Essential Questions for Deciding if Your Organization is Ready for E-learning. *Distance Learning*, 11(4), 47-50.

- Wedman, J., & Tessmer, M. (1993). Instructional designers decisions and priorities: A survey of design practice. *Performance Improvement Quarterly*, 6(2), 43-57. doi:10.1111/j.1937-8327.1993.tb00583.x
- Welsh, E. T., Wanberg, C. R., Brown, K. G., & Simmering, M. J. (2003). E-learning: Emerging uses, empirical results and future directions. *International Journal of Training and Development*, 7(4), 245-258.
- Womble, J. C. (2008). E-learning: The relationship among learner satisfaction, self-efficacy, and usefulness. *The Business Review, Cambridge*, 10(1), 182-188.
- Wong, W.-T. (2015). The effects of e-learning system service quality and users' acceptance on organizational learning. *International Journal of Business and Information*, 6(2). 205-225.

Appendix A

A Organizational Readiness Survey

Leadership/Management

Organizational Environment	Categories	Assessment question	Checklist
	Organizational goals	3. What is the vision/mission of your organization? 4. Is a training plan in place within your organization? 5. What is the goal of training in your organization? (Vision: What is the objective of the training?) 6. How do you define e-learning? 7. Why is the organization considering e-learning? 8. How do you think e-learning will be useful to your organization? 9. What type of training are you thinking of using e-learning for?	☐ Aware of the relationship between organizational goals and training ☐ Has a definition of e-learning ☐ Aware of how e-learning could be useful to the organization ☐ Aware of training plans and initiatives ☐ There is a goal for using e-learning
	Leadership/Management Support	1. Who will make the e-learning decisions? 2. How would you define e-learning success? 3. What is your view on using computer technology for learning? 4. How important do you think technology is to e-learning?	☐ Knows who makes the decisions ☐ Learning success is defined ☐ Expresses an opinion about the role of technology
	Learning Culture	1. What incentives does your organization offer for training? 2. What are your views on training incentives? 3. What are your views on organizational learning? 4. What are your views on e-learning? 5. What policies are in place for training?	☐ Training incentives are offered ☐ Training incentives are supported by management ☐ Supports learning in the organization ☐ Supports e-learning

Categories	Assessment question	Checklist
Initiative adoption	1. What was your role in past training initiatives? 2. How has your organization handled new initiatives in the past? And with what success? 3. How do you think training policies need to change to accommodate e-learning? 4. How would e-learning be implemented? 5. How would e-learning be promoted to employees?	☐ Aware of training policies ☐ Takes an active role in new initiatives ☐ Recognizes how past initiatives have been handled ☐ Aware there may be need for policy changes ☐ Has considered an implementation plan or being considered ☐ Communication plan has been considered
Finance	1. What are your anticipated costs? 2. What do you anticipate will be the most costly part of the project? 3. What are your anticipated savings? 4. How have training initiatives been assessed and evaluated in the past? 5. How would the e-learning initiative be assessed and evaluated?	☐ Both savings and costs have been considered ☐ Both soft and hard aspects have been considered, ROI and ROE ☐ Past initiatives were assessed and evaluated ☐ Aware of the need for an e-learning evaluation plan
Human Resources	Knowledge Management	3. How is knowledge managed in your organization? ☐ aware of a knowledge management procedures
	People Involved	1. What departments will be involved in the implementation of e-learning? 2. What departments will be involved in decisions about e-learning? 3. What personnel will be needed to design, develop, administer, manage, maintain and support delivery? ☐ Aware of the need for involvement of various departments ☐ Aware of the implications for e-learning in terms of new personnel

Categories		Assessment question	Checklist
Technology			☐ Aware of cost implications for new vs. outsourced personnel
	Access	1. What is the organizations role in facilitating access to e-learning? 2. When and where do you anticipate employees will access e-learning?	☐ considered the infrastructural implications of learner access ☐ Considered the work life balance with e-learning
	Maintenance Integration	3. How does your organization currently, manage update and sustain computer technology? 4. What are the costs associated with learning technologies being able to integrate with existing IT?	☐ Considered the impact on the e-learning initiative ☐ Considered the financial implications for updating and maintain technology ☐ Considered the financial implications for integration/ non integration of technology

Appendix B

B Organizational Readiness Survey

Human Resource Readiness Questions

Categories	Assessment question	Checklist
Organizational Environment	Organizational goals 1. What is the vision/mission of your organization? 2. Is a training plan for your organization? 3. What is the goal of training in your organization? (Vision: What is the objective of the training?) 4. What knowledge or skill is your organization trying to improve using e-learning? 5. How do you define e-learning? 6. How do you think e-learning will be useful to your organization?	☐ There is a training plan ☐ There is a relationship between organizational goals and training ☐ There is a link between training and performance improvement ☐ Has a definition of e-learning ☐ There is a reason/goal for wanting to use e-learning ☐ Aware of how e-learning could be useful to the organization
	Organizational Leaders (Leadership/Management) Support 1. Who will make the e-learning decisions? 2. How do organizational leaders support policies for training? 3. How do organizational leaders support training incentives? 4. How do you think organizational leaders feel about organizational learning? 5. How do you think organizational leaders feel about e-learning?	☐ Knows who makes the decisions ☐ Leaders/managers support training policies ☐ Leaders/managers support training incentives ☐ Leaders/managers support learning ☐ Leaders/managers have positive attitudes toward e-learning

Categories	Assessment question	Checklist
Learning Culture	1. How would you define learning success? 2. What is your view on organizational learning? 3. What training methods have been used in the past? 4. What are the training incentives offered by your organization? 5. What is your view on using computer technology for organizational learning? 6. How do departments currently work on common projects?	☐ Definition for learning success ☐ Supports organizational learning ☐ Describes past training incentives ☐ Positive attitudes toward technology in learning ☐ Departments work collaboratively
Initiative adoption	1. What is your role in learning/training initiatives? 2. How has your organization handled new initiatives in the past? And with what success? 3. What do you think e-learning will look like? 4. How do you plan to implement e-learning? 5. How do you plan to promote e-learning to employees? 6. How do think e-learning can support training incentives?	☐ Takes an active role in new initiatives ☐ Implementation of new initiatives have been positive ☐ There is an implementation plan being considered ☐ Communication plan in place or being considered ☐ Has views on using e-learning flexibility
Finance	1. What would be the costs associated with personnel who will be needed to design, develop, administer, manage, maintain and support delivery? 2. How have training initiatives been assessed and evaluated in the past? 3. What are your plans for assessment and evaluation of the e-learning initiative?	☐ Has considered costs and savings associated with personnel for design and development ☐ Aware of cost implications for new and outsourced personnel ☐ An assessment and evaluation plan is in place or

Categories		Assessment question	Checklist
Human Resources	Knowledge Management	1. How is knowledge managed in your organization? 2. What are the training policies? 3. What are employees' level of education? 4. What courses have employees taken in the past? 5. What will be employee strengths and weakness if the organization decides to adopt e-learning? 6. What knowledge or skills is the organization trying to improve?	being considered for e-learning ☐ There is knowledge management ☐ Aware of training policies ☐ Employee information can be accessed ☐ HR is aware of employee limitations with respect to computer technology use ☐ Knows what knowledge and skills need to be improved.
	People Involved	1. What departments will be involved in the implementation of e-learning? 2. What personnel will be needed to design, develop, administer, manage, maintain and support delivery?	☐ More than one department will be involved in the implementation of e-learning ☐ Aware of the personnel that would be necessary for adopting e-learning
Technology	Access	1. How do you plan to determine employee use of e-learning? 2. How will the organization facilitate access to e-learning? 3. How do think e-learning should be structured?	☐ Monitoring/ tracking plan has been considered ☐ A plan to encourage and facilitate access ☐ Considering several ways of structuring content
	Maintenance Integration	1. How does current computer technology management and updates affect you/your department? 2. How do you think e-learning technology can be integrated with the current computer technology?	☐ The currents system is managed well, system is reliable ☐ Seamless and useful integration

Appendix C

C Learner Readiness Survey

(Employees within the organization)

Organizational Environment	Categories	Assessment question	Checklist
	Organizational goals	1. What is the mission/vision of your organization? 2. How is training related to your job description? 3. How has training helped you with your job? 4. How do you define e-learning? 5. How do you think e-learning will be useful to your organization?	☐ Aware of the relationship between organizational goals and training ☐ Finds training useful to job ☐ Has definition of e-learning ☐ Has ideas of how e-learning could be useful to the organization
	Leadership Support	1. How does your organization support your learning? 2. How does your manager feel about learning/training? 3. What are the opportunities for applying material learnt in training?	☐ Organization leaders supports learning ☐ Manager supports learning and training ☐ There are opportunities to apply training content to job
	Learning Culture	1. How important is organizational learning to you? 2. How would you define learning success? 3. How has training been useful to you? 4. What motivates you to pursue further training/learning? 5. What incentives does the organization offer to encourage organizational learning? 6. How are learning activities organized to accommodate participation?	☐ Values organizational learning ☐ Values training ☐ Organization offers training incentives to encourage learning ☐ Motivation ☐ Self-Development ☐ Incentives

Categories	Assessment question	Checklist
	1. How do you define e-learning success? 2. How do you think e-learning will be useful to you? 3. What do you think would be your strengths and weakness if your organization decides to adopt e-learning?	☐ Learning activities are part of everyday activities within the organization ☐ Values learning opportunities ☐ Has a definition for learning success ☐ Self-aware/ reflective about strengths and weaknesses
Initiative adoption	1. How did you respond to the last new initiative in your organization? 2. What do you think needs to change to accommodate e-learning? 3. What do you think e-learning will look like? 4. What will determine whether you use e-learning or not?	☐ Supportive of new company initiatives ☐ Ideas about barriers to using e-learning ☐ Has an idea about the structure of e-learning
Finance	1. What are your current financial responsibilities for training? 2. What financial responsibilities are you willing to undertake for e-learning?	☐ Employees assume financial responsibility for training ☐ Employees have thought about costs for training
Human Resources	Knowledge Management (KM) 1. What is your level of education? 2. What courses have you taken in the past? 3. What basic functions can you perform on a computer?	☐ Education level matches job requirements ☐ Good computer self-efficacy ☐ Learners have basic technical skills or are willing to learn

Categories		Assessment question	Checklist
Technology	People Involved	1. What is your role in decisions about organizational learning needs? 2. How do you use computers now in your daily tasks? 3. What is your experience with learning using e-learning? 4. What will be the role of learners in the e-learning process? 5. How important do you think technology is to learning? 6. How do you feel about using computer technology for learning (e-learning)? 7. How do you think e-learning will be different from current training methods?	☐ Learners are part of the decision making process ☐ Regularly uses computers in daily tasks ☐ Experience using computers ☐ Content decisions are part of learner needs ☐ Learners are willing to use technology ☐ Learners have a positive attitude toward e-learning/ learning ☐ Has participated in e-learning ☐ Learners know the difference between face to face and e-learning for training access
	Access	1. Where do you currently participate in training? 2. How do you access training? 3. How will you access e-learning? 4. What type of computer technology do you currently own? 5. What times of the do you access training? 6. What do you think e-learning should look like in order for you to use it?	☐ Learners have/will be given the necessary hardware and software to access e-learning ☐ Has considerations for varied times of access ☐ Learners have an understanding of their learning needs
	Maintenance		

Categories	Assessment question	Checklist
Integration	1. What are your current experiences with maintenance and updates of computer technology? 2. How do you think e-learning technology can be integrated current computer technology for e-learning?	☐ unaffected by system maintenance and updates ☐ Reliable to system users

Appendix D

D. Technology Readiness Survey (IT department)

Organizational Environment	Categories	Assessment question	Checklist
	Organizational goals	1. What is the vision/mission of your organization? 2. What do you think is the goal of training in your organization? (Vision: What is the objective of the training?) 3. How do you define e-learning? 4. How do you think e-learning will be useful to your organization?	☐ Aware of the relationship between organizational goals and training ☐ Has a definition and concept of e-learning ☐ Aware of how e-learning could be useful to the organization
	Leadership Support	1. Who will make the e-learning decisions? 2. How do organizational leaders/ managers support training? 3. How do organizational leaders/managers support training incentives? 4. How does organizational leaders/managers feel about learning/training? 5. How does organizational leaders/managers feel about e-learning?	☐ Awareness about who makes the decisions ☐ Leaders/ managers support learning/training incentives ☐ leaders/managers support learning in the organization ☐ leaders/managers have a positive attitude towards e-learning
	Learning Culture	1. What incentives does your organization offer for training? 2. What are your views about organizational learning? 3. What are your views about e-learning? 4. How do you think e-learning will be different from current training methods?	☐ Learning success is defined similar to the organization ☐ Supports learning in the organization ☐ Positive attitude toward e-learning ☐ Have considered the differences between

Categories	Assessment question	Checklist
Initiative adoption	1. What has been your role in new initiatives? 2. How has your organization handled new initiatives in the past? 3. What do you think e-learning will look like? 4. What do you think e-learning should look like in order for employees to use it? 5. What will be the implications of e-learning for your department?	traditional training and e-learning ☐ Takes an active role in new initiatives ☐ Aware of past of how initiatives have been adopted in the past ☐ Has ideas about e-learning ☐ considered barriers to e-learning ☐ Aware of the implications of e-learning for their job descriptions
Finance	1. What do you think will be the most costly part of the project? 2. What are the cost associated with current technology used within the organization? (management, update and sustain computer technology) 3. What will be the role of technology in the e-learning project?	☐ Has thought about the costs involved in e-learning ☐ Additional cost for maintenance and updates have been considered ☐ Several aspects of technology costs have been considered
Human Resources	Knowledge Management	☐ Aware of a knowledge management ☐ Aware current skills within the department
	People Involved	☐ The department understands their role and is part of the adoption process

Categories		Assessment question	Checklist
Technology		3. What will be your role in implementation of e-learning?	☐ Aware of training plans and initiative
		4. How important do you think technology is to e-learning?	☐ Individuals understand their roles in e-learning implementation
		5. What is your experience with e-learning technology?	☐ Has a clear view about the role of technology ☐ IT department is knowledgeable about e-learning or will be trained
Technology	Access	1. How will your department facilitate access to e-learning?	☐ Accessibility plan has been considered
		2. How will you determine whether employees use of e-learning?	☐ Monitoring/ tracking plan has been considered
		3. How do employees currently use computer technology within the organization?	☐ Aware of how employees currently use computer technology
Technology		4. What do you anticipate will be the barriers to e-learning?	☐ Aware of the limitations of the department
	Maintenance	1. How does your organization currently, manage update and sustain computer technology?	☐ Knows how computer technology is currently managed
	Integration	2. How do you anticipate e-learning fitting into your current IT infrastructure?	☐ organization consistently maintains and updates computer technology ☐ Has ideas about how e-learning will fit into the current infrastructure

Appendix E

Final Checklist and Recommendations

E¹ Organizational Environment

	Support Systems	Learner	Content Design	Checklist	Recommendations
Organizational Environment	Organizational Goals 1. What is the vision/mission of the organization? Training Plan: 2. Is a training plan in place within the organization? 3. What is the goal of training in the organization? (What is the objective of training?) 4. How is training linked to performance improvement? 5. How will e-learning be useful to the organization?	1. What is the mission/vision of the organization? 2. How is training related to employee job description? 3. How has training helped employees with their job? 4. How is e-learning defined? 5. How do employees think e-learning will be useful to the organization?	1. What knowledge or skill is the organization trying to improve? 2. What type of training is the organization planning to carry out with e-learning? 3. How is training content related to employee job descriptions?	☐ Mission/ Vision exists ☐ Everyone is aware of the mission/vision ☐ there is a training plan ☐ The goal of training is related to the vision and mission ☐ Training is linked to a performance improvement. ☐ There is a common definition for e-learning ☐ E-learning will assist with achieving performance goals	1. Performance goals should be linked to organizational goals which in turn is related to the type of content and choice of technology. 2. Employees should see the link between their jobs and training within the organization. 3. Any type of knowledge and skill can be taught as long as it takes advantage of the attributes of the medium and addresses performance goals. 4. E-learning will help with organizational training plan and goals. E-learning can be one of many performance

	Support Systems	Learner	Content Design	Checklist	Recommendations
					solutions to address performance needs.
	Organizational leaders (Leadership/management) Support: 1. Who will make the e-learning decisions? 2. How do organizational leaders define e-learning success? 3. What are the views of leaders on training incentives? 4. What are the views of organization leaders/managers on organizational learning? 5. What are the views of organization	1. How is organizational learning supported? 2. How do managers feel about learning/training? 3. What are the opportunities for using material learnt in training?	1. How will e-learning content fit the needs of the organization?	☐ Decision makers identified ☐ Definitions of learning success is the similar to employees ☐ Management creates opportunity to use new knowledge and skills ☐ Leadership has a positive attitude toward e-learning ☐ learning is supported in the organization ☐ Changes to training policy have been considered	1. Leadership support is key- leaders/managers need experience or understand the e-learning systems to become “champions”, possible orientation for managers. 2. Managers need to create opportunity for application of learnt material – transfer of learning. 3. It is important to know who make the e-learning decisions in order to know who to ask the correct questions.

	Support Systems	Learner	Content Design	Checklist	Recommendations
	leaders on e-learning?				
	Learning culture: 1. What types of training methods have been used in the past? 2. How is organizational learning generally viewed? 3. What are general attitudes toward learning? 4. What are general attitudes toward e-learning? 5. What incentives does the organization offer for training? 6. How will e-learning success be defined?	1. How do employees define learning? 2. How do employees define e-learning success? 3. What motivates employees to pursue further training? 4. How is training useful to employees? 5. How do employees think e-learning will be useful to them? 6. How much time do employees allocate to learning? 7. What is the role of employees in decisions about organizational learning needs?	1. How can content be designed to support training incentives?	☐ there is variation in performance solutions ☐ there are positive attitudes toward learning ☐ there is a common definition for learning and e-learning success ☐ Employees see the value of learning ☐ Organization provides learning incentives ☐ time allocation ☐ promotion and recognition ☐ Employees are part of the decision process for organizational learning ☐ Organization considers work /life balance	1. There should be consensus on the definition of e-learning and e-learning success is required, since e-learning is highly contextualized. Differences lead to confusion in relation to where money is to be spent. 2. A positive attitude toward learning in general. 3. Employees can see how information is useful to them no matter what the medium. 4. Organization can create opportunity for learning. Use both formal and informal activities to connect learning to work E-learning can become part of work conditions.

	Support Systems	Learner	Content Design	Checklist	Recommendations
					5. Provide incentives in the form of time allocation, promotion and recognition, flexibility of time for studying during the work day, employees play a role in the process. 6. Content design can facilitate incentives – modular format, employees can start, stop and return to content at any point.
	Initiative adoption: 1. How has the organization handled new initiatives in the past? And with what success? 2. How does the organization plan to implement e-learning? 3. How does the organization plan to promote e-learning?	1. How did employees respond to the last new initiative in your organization? 2. What were the roles of employees in the last new initiative? 3. What will be the implications of an e-learning initiative on departments? 4. What will determine whether	1. How can content be designed to facilitate easier adoption?	☐ New initiatives gradually implemented. It should take place in stages ☐ Employees are/were supportive of new initiatives ☐ Strategic plan was in place for new initiatives ☐ There needs to be a way for	1. Past responses to change may be indicators of future adoption. 2. Good communication, promotion and organizational strategies need to be considered – change management plan. 3. Start with a pilot project. Start small. Implement e-

	Support Systems	Learner	Content Design	Checklist	Recommendations
		employees use e-learning or not?		communication on initiative ☐ Employees are/were aware of their departmental and individual roles ☐ Content should be easy to use and of high quality	learning slowly, begin with a pilot project involving one department. 4. Sell e-learning from the point of individual gains and benefits. 5. Develop a strategic e-learning plan 6. System is reliable and of high quality
	Finance: 1. What are the anticipated cost factors? 2. What are the anticipated savings? 3. What does the organization anticipate will be the most costly part of the project? 4. How is technology seen as a cost factor? 5. How have training initiatives been assessed and evaluated in the past? 6. What are the organizations' plans for assessment and	1. What are employees' current responsibilities for training? 2. What would be employee financial responsibility? Do employees have to purchase computers and mobile technology that would facilitate e-learning? 3.	1. How much will be allocated for content development and production?	☐ Budget considers all aspects of the e-learning project ☐ Financial plan includes both savings and costs ☐ Initiatives have been assessed and evaluated in the past ☐ There is a plan to assess e-learning ☐ Employees are aware of their financial roles in the venture	1. Calculate both return on investment (ROI) and Return on Expectation (ROE) 2. Consider personnel needed for design & development, administer, technology, manage, maintain and support delivery, distribution and marketing, time in terms of productivity. 3. An assessment/assessment plan should be in place to determine whether e-

	Support Systems	Learner	Content Design	Checklist	Recommendations
	evaluation of the e-learning initiative?				learning has met its objectives. 4. Weigh employee roles in terms of purchase of hardware/software and payment for e-learning.

E² Human Resources

	Support Systems	Learner	Content		Recommendations
Human Resources (People)	Knowledge Management: 1. How is knowledge managed in the organization? 2. What are the training policies? 3. How will e-learning affect training policies?	1. What are employees' level of education? 2. What courses have employees taken in the past?	1. What do you think e-learning will look like? 2. How do you envision e-learning will be structured? Modular, online, self- paced, job aide? 3. How will content be designed to accommodate employee needs?	☐ HR tracks employee knowledge, skills, competencies ☐ HR is aware of employee skills and competencies ☐ HR tracks training courses employees have taken ☐ Training policies are in place	1. Good knowledge management of where knowledge is in the organization and who needs it. Tracking employees training progress and skills. This information should be available in HR records. 2. Training policy needs to be updated, to reference and reflect use of technology and set standards for learning accountability. A new training policy should include policies on technology, time and access. 3. Plan several levels of content to allow employees to reach required competencies.

	Support Systems	Learner	Content		Recommendations
	People involved: 1. How important does the organization believe e-learning is? 2. How do departments currently work on common projects? 3. What departments will be involved in the implementation of e-learning? 4. What departments will be involved in decisions about e-learning? 5. What personnel will be needed to design, develop, administer, manage, maintain and support delivery? 6. What are the knowledge, competencies and experience of personnel who will be involved with e-learning?	1. What basic functions can employees perform using computer technology? How do employees use computer technology in their daily tasks? 2. What is employee experience with learning using computer technology? 3. What will be the role of employees in the e-learning process? 4. Are employees willing to use technology for learning? 5. What will be employee strengths and weakness if the organization decides to adopt e-learning?	1. Will material be designed internally or externally?	☐ Departments work collaboratively ☐ Employees are part of the decision making process ☐ Multi-disciplinary team will be involved ☐ IT department is part of the initiative ☐ People involved are knowledgeable about e-learning ☐ Plan for employee upgrade or “buy in” ☐ There is consensus on a definition for e-learning	1. Consensus on an e-learning definition allows everyone to move toward the same goal. 2. A multidisciplinary approach so that needs of all departments are met. Systems and collaborative thinking. 3. Internal development; personnel with the competencies and skill are available. External development: personnel and skill are unavailable. 4. Competency test/ pre assessment to establish technical and pre requisite skills. Varying level of content to accommodate differences in competencies and facilitate up grading of skills.

	Support Systems	Learner	Content		Recommendations
		6. What basic functions can employees perform on a computer?			

E³ Technology

	Support Systems	Learner	Content		Recommendations
Technology	Access: 1. How do employees currently use computer technology? 2. What will be the role of technology in the e-learning project? 3. What are the anticipated barriers to accessing e-learning?	1. Where do employees currently participate in training? 2. How do employees currently access training? 3. How will employees access e-learning? 4. How do employees feel about using computer technology for learning? 5. How do employees use computers now in their daily tasks? 6. What is employee experience with learning using e-learning? Computer technology? 7. What time of the day do employees currently access training? 8. What do employees think e-learning will look like? 9. What do employees think e-learning should look like in	1. How can content be adapted to facilitate access?	☐Technology chosen related to organizational need and content ☐Plans are in place for learner access ☐Learners have the necessary technical skills to access learning ☐Organization is willing to facilitate e-learning during work hours ☐Content has many formats ☐Learners have positive attitudes with respect to learning through computer technology	1. E-learning should drive the technology/ not the other way around. Technology choice is context specific. 2. Technology is of high quality and consistent. 3. Adopt the simplest form of technology suitable for context, resources and can solve the performance problem. 4. Employees should have the necessary tools to access e-learning. 5. Previous computer experience related to better attitudes toward using e-learning.

	Support Systems	Learner	Content		Recommendations
		order for them to use it?			6. Perceived ease of use is related to intention to use computers
	Maintenance: 1. How is computer technology currently utilized within the organization? Communication, carry out daily tasks? 2. How does the organization currently, manage update and sustain computer technology? 3. How will the organization update and maintain e-learning?	1. What are employees' current experiences with maintenance and updates of computer technology?	1. How will be /is content be updated and maintained?	☐ Computer technology is widely utilized in the organization ☐ Organization continuously updates and maintains computer technology ☐ E-learning will be of high quality and usable	1. Maximize the use of current IT infrastructure. 2. Perceived ease of use is related to continue using technology.
	Integration: 1. How will the IT Department be involved in the e-learning initiative? 2. How are learning technologies able to integrate with existing IT?		1. How can content be adapted for e-learning? 2. Where will content be developed? Internally or externally?	☐ Current system has the capacity for integration ☐ IT Department is part of the initiative	1. IT department should be part of the multidisciplinary team in order to address their concerns. Upgrading of skills may be necessary to

	Support Systems	Learner	Content		Recommendations
					accommodate learning technologies. 2. E-learning technologies should as much as possible be integrated into existing technology in order to reduce cost. Vendors can assist with integration problems.

Appendix F

E-learning Literature review

Organizational Environment

Organizational Goals. What role would organizational goals play in e-learning readiness? Why is this important? Organizational goals are associated with the reasons organizations choose to use e-learning. Solutions to performance problems should be aligned with organizational goals. For example, Ho and Dzeng (2010) found that mandatory training, used to prevent loss of life in construction safety training via e-learning, aimed at reducing economic costs. Table 1. Shows a variety of organizational goals which drove the decisions to use e-learning.

Table 1. Showing the reasons why Organizations choose to adopt e-learning	
Citations	Purpose for adopting e-learning
Borotis et al. (2005)	Uses reviews of corporate strategy to develop training plan and training objectives
Dai (2007)	The driver was to improve customer service
Harfoushi et al.(2010)	TAG – the organizations main goal was to save time and money Orange - save time and money, improve human capital, have a competitive advantage, support innovation
McKee (2006)	Used companies' 5 year strategic plans to link employee learning to company goals.

Chuang et al. (2008) state that performance problems within the organization should be linked with the adoption and assimilation of e-learning. The question “How do you define e-learning?” was included on every survey. Organizations such as General Motors University (2005) and Proctor and Gamble (2005) began the e-learning initiative with a definition of e-learning, which then lead the way for decisions about how e-learning could be used to achieve

organizational goals. Howard (1998) states that though electronic education plans may differ from organizational plans it may be possible to link e-learning to an existing change process.

As evaluation proceeded it was recognized that the themes did not directly address the role of current training as an effect on e-learning readiness. Only learning was addressed and found to be an important construct for e-learning readiness in the analysis phase. Is there a difference between the training and learning in relation to e-learning? Is there a need for a term that describes training specifically in e-learning? E- Training? Newton and Doonga (2007) define e-training as opposed to e-learning as “an environment in which training or instruction in a huge range of skills and techniques can be developed using computer technology” (p.112). Training is an event or process where employees develop skills and knowledge that are expected to be useful for improving performance in the organizational environment (Swinney, 2007). Training is usually instructor centered. Learning is acquisition of skills and knowledge that learners acquire and can be used not only in a work situation but throughout life. E-learning somewhat blurs the line between training and learning since its flexibility makes a training event decisively different. What used to be a one-time event may now have no fixed time or place but can remain continuous depending on the structure of the content. E-learning redefines the concept of training as training may take many forms both passive and active. Whatever is learned may be useful immediately or over time. Current training practices may also be indicators of to what (Senge, 1990) refer to as systematic processes. Since training is aimed at gaining or improving a skill it can be directly linked to the employee job or performance in their roles. The question “How has training helped you with your job?” was incorporated into the surveys.

Table 1 shows the relevant citations which provided examples of organizations who related organizational goals to performance goals.

Leadership/Management Support. One of the themes identified was a supportive learning environment. Articles which discussed leadership role in e-learning and recognized the need for leadership support, although each organization had different definitions of what a leader is. For example, in the case of General Motors University and Proctor & Gamble leaders were CIOs and Presidents who supported learning initiatives; other organizations refer to upper management . Ali and Magahhaes (2008) refer to two different types of managers, senior managers and middle management. IBM defines a manager as “someone who has the power to hire, fire and evaluate others” (p. 111). For the purpose of this research this definition is used to describe leaders of the organization whether from presidents to middle managers. Table 2. Outlines some of the examples of leaders.

Table 2: Organizational definitions of leaders	
Management	Citation
Presidents, CIO, Vice presidents	(General Motors University, 2005; Proctor & Gamble, 2005)
Upper management, executive officer	(Chuang et al., 2008; McKee, 2006)
Middle management	(Borotis et al., 2005; Harfoushi et al., 2010; Newton & Doonga, 2007)

Harfoushi et al. (2010) describe the ideal characteristics of good leaders in the adoption process, and their need to be convinced about the value of the system. When managers are committed they encourage employees to use the system. Leaders should have good communication skills and knowledge and competence about the e-learning system. Ali and Magalhaes (2008) describe two problems in leader attitudes. Firstly senior managers see e-

learning as a “cheap” or watered down option to training. Secondly, middle managers are afraid of empowering employees, fearing that they will take their jobs. Harfoushi et al. (2010) through their study at Talal Abu Ghazaleh (TAG) found that some managers did not believe in e-learning and thought this was an unnecessary cost. This resulted in reluctance to encourage use of e-learning. Since leaders hold positions of power, gaining management support has to be deliberate and systematic. They determine the financial allocations for all kinds of training including e-learning. They set the pace for the atmosphere with respect to learning.

Leaders can serve as first adopters which is very important for “selling” e-learning and successful implementation. Their experiences with the system help them to understand realistically the challenges faced by the employees and to acquire the technological skills needed to navigate the system. Borotis et al. (2005) state that managers who had not used e-learning did not appreciate the knowledge and skills acquired by their charges because they themselves lacked training. Apart from gaining the skill required to use e-learning, leaders can become advocates and champions for the system. Leaders need to motivate workers to use the system. Management support is imperative and can positively influence motivation or cause barriers (Steenekamp et al., 2012). As part of their e-learning strategy Proctor and Gamble trained administrative staff to support the LMS. To achieve change, support must come from leaders.

Does the organization provide support and opportunities to use the new knowledge?

Chuang et al. (2008) states that managers should create opportunities for learners to use new knowledge. Learners identify the applicability of content to their work situation as one of the motivational factors for using e-learning. In order for learners to apply content learned, opportunity must be created by leaders. Chen (2008); Schweizer (2004) state that support of senior managers can facilitate transfer of knowledge. Managers helped facilitate the change

process in Trans Asia by giving pilots the opportunities to apply newly acquired skills (Chuang et al., 2008). Senior management support for e-learning has been one of the factors linked to its success (Hung et al., 2009; Nakayama et al., 2005; Purnomo & Lee, 2013). Management support affects how learners perceive e-learning usefulness and ease of use (Purnomo & Lee, , 2013). Given the many roles that leaders play in the adoption of e-learning, a separate category was added to the e-learning readiness analysis tool to find out the role of leaders. Many articles made reference to the need for leadership support; even in situations where support was lacking recommendations suggested the need to get leaders on board (Annansingh & Bright, 2010; Purnomo & Lee, 2013).

Learning Culture. There were very few studies which addressed the idea of learning culture directly. The researcher found that good indicators of learning cultures were found in descriptions of learning processes and practices. A supportive learning environment is reflected measures used to promote and change attitudes toward learning. Wong (2015) suggests that “e-learning is an important tool for accelerating the effectiveness of organizational learning.”(p. 221). In the two case studies described in Harfoushi et al. (2010) one of their biggest challenges was over coming cultural resistance. One of the companies took extreme measures by offering packages of 25 months salary to resistant people to resign. This was done in order to remove negative feeling toward the incentive. From the themes developed earlier learning culture should take into consideration the learning environment, value of learning, learning processes and incentives.

The formality and informality of learning within organizations are a general reflection of how the organization views and treats learning .(IBM (2005) began its e-learning initiative with a learning vision to create an environment where it is easy to learn, share and use knowledge.

They did this by integrating e-learning into the routine activities of the company. While formal events are useful to carryout targeted knowledge and skill development, informal learning events provide opportunities for knowledge sharing and best practices within organizations. In HP services work force development, the case study describes two purposes for e-learning architecture, “e-training” and “e-learning”. “E-training” encompassed using courses in various virtual formats and “e-learning” represented learning activities which encourage knowledge management and sharing (Waight & Stewart, 2005b). When Trans Asia was trying to adopt a new learning culture they encouraged employees to access not only course content in the e-learning platform but also company news and other important information. They also encouraged employees to share information through the websites discussion forums (Chuang et al., 2008).

Another way organizations tried to encourage learning is by offering a variety formats. Table 3. shows the variations in offering in organizations. Organizational learning should provide an environment of equal learning opportunity for all (Chuang et al., 2008). Dai and Duserick (2007) state that NCR has long placed an emphasis on organizational learning by continuously integrating new learning solutions. They adopted several approaches using e-learning shown in Table 25. Their approaches were focused on improving competencies. Proctor & Gamble (2005) offered e-learning courses free. At the same time in order to encourage learning the same content was delivered in alternate modes. This method ensured that learning took place by whichever method learners felt most comfortable. The variety of learning and training formats show that learning in these organizations is not only about e-learning but also has a wider learning agenda.

Table 3: Showing the types of formats used for e-learning	
Citation	Types of formats.
Waight and Stewart (2005b)	Case study 1. Insurance company- e-learning activities, workshops, online courses, blended and instructor-led training. Case study 3. Retail store – blended, computer based modules, virtual classrooms
Dai and Duserick (2007)	NCR Corporation - Centralized learning processes, blend of e-learning and classroom training, personal development programs
Borotis et al. (2005)	Several options for corporate training- classroom based, on the job, self-training e-learning (note here how e-learning is defined)
General Motors University (2005)	Classroom delivery, satellite broadcasts, electronic and web applications, learning laboratories

Several types of learning rewards and incentives were offered to encourage e-learning. (Chuang et al., 2008) suggests changes in regulations and operational systems to reward e-learning use. Intrinsic incentives should be related to the personal value of learning while extrinsic incentives should relate to established policy (Comacchio & Scapolan, 2004). Examples of intrinsic incentives were the development of individual road maps and achievement goals road maps (Borotis et al., 2005; Waight & Stewart, 2005b), CareerPlanner software was used to formulate individual development plans (IBM, 2005). Extrinsic motivators included certificates (Chuang et al., 2008; Harfoushi et al., 2010), monetary and gift rewards (Harfoushi et al., 2010; Steenekamp et al., 2012).

Special mention must be given to the impact of time on e-learning. Time is an unusual extrinsic motivator but several studies identified lack of time as a barrier to successful e-learning (Annansingh & Bright, 2010; Ettinger & Holton, 2005). E-learning adds additional strain on the

work life balance and so it was necessary to offer more flexible learning options both in time and in content structure (IBM, 2005). Extra hours are needed to use e-learning and so many organizations allow learners to work at their desks during the work day. This still proved challenging due to potential interruptions (Becker et al., 2013). Schreurs et al. (2008) suggest flexible hours for employees using e-learning.

As indicated in the section on learning goals training processes in the institution give a good idea of the attitudes within organizations with respect to learning and so the question “What training methods have been used in the past?” is included in Survey B (the HR survey) as a way of exploring the organizational processes. Before e-learning can be accepted learning has to be accepted. Learning as a culture, facilitates better acceptance of e-learning. Learning opportunities can be formal or informal, creating opportunity for both personal and organizational growth.

Initiative Adoption. Adoption of e-learning requires a change, a change from what employees are used to for instructional delivery (Nakayama et al., 2005). How is the initiative going to be accepted and sustained? Several of the emerging themes for organizational readiness, some of which have been discussed earlier in the chapter, are linked to the adoption initiative. For this section we will discuss are systematic processes and communication as part of initiative adoption.

Rogers (2005) indicates that in adoption of an innovation past methods serve as relatively good indicators of how an initiative will be adopted. E-learning is no exception. Examples of methods used to initiate adoption are outlined in the table 4 below. Each method is aimed at getting learners used to e-learning as an instructional medium. One of the biggest changes identified is the ability to overcome resistance and create positive attitudes toward the new

format (Becker et al., 2013; Schreurs et al., 2008). In the mandatory situations learning decisions were a top down approach while the voluntary organizations encouraged a more participatory approach to learning.

Table 4. Showing the methods used to get organizations to use e-learning	
Method	Citation and reasoning
Mandatory	Borotis et al. (2005) – obligated to attend and pass specific e-learning courses before doing classroom training in the same topic.
Mandatory up to a point	Orange in Harfoushi et al. (2010) – They are required to take particular e-learning courses at one level, then given a choice of e-learning course on completion.
Free and voluntary	BBC in Ettinger and Holton (2005)- in order to get as many people using the system as possible. TAG in Harfoushi et al. (2010)- e-learning was voluntary (they did not have a mandatory policy but using e-learning was tied to job promotion). Chong, Martinsons, and Wong (2004) – learning was voluntary but users who complete the first half of the course were rewarded.
Paid for by learners	General Motors University (2005) – the General Motors University is a breakeven institution so that learners pay the minimum to cover actual costs.

Gradual adoption of e-learning is recommended (Berge, 2007; Chuang et al., 2008; Hall, 2002). A good example of this is Trans Asia Airways. It implemented e-learning courses in different phases beginning with the group that most urgently needed training. This allowed the company to overcome any problems with the first adoption before moving onto the next (Chuang et al., 2008). NYNEX adopted the technology that was available at the time. With each iteration new tools with different attributes were used (Howard, 1998). Their strategy not only helped sort out initial problems with the technology, it also created new champions of the initiative.

Early literature on e-learning such as Rosenberg (2001) emphasizes need for a change management plan for successful implementation of e-learning. While a change management plan would greatly assist in the implementation of e-learning it is not absolutely necessary. The case studies proved that this was an incorrect assumption. Companies such as the BBC in Ettinger and Holton (2005) took a less structured approach and their initiative still progressed successfully. They began with a small project and a few people who were enthusiastic about e-learning, and eventually spread the idea to the wider organization after benefiting from the lessons of the pilot tests. In many cases these enthusiastic groups are the early adopters and eventually become champions for the e-learning initiative. These champions emerge through participation in a pilot project or involvement in the implementation process. (Chuang et al., 2008; Ettinger & Holton, 2005)

Whether an implementation plan is in place or not learners cannot use the system unless they know what is offered. The intention to participate in the process has to be stimulated through communication. Harfoushi et al. (2010) identifies that one of the desired characteristics of leaders is good communication skills. (General Motors University, 2005) and Proctor and Gamble (2005) both market e-learning to managers and leaders first so that they can assess the benefits of the training. Nakayama et al. (2005) identify lack of communication as a hindrance to the change process. The ability to communicate effectively helps leaders spread the word about e-learning through positive experiences.

Finance. Very few of the studies mention financial concerns explicitly except when referring to the advantages of e-learning through the savings that it can accrue. The financial question is, however, one of the most crucial since it affects all parts of the e-learning initiative. Hung et al. (2009) found that economic cost of the system has a negative influence on decisions

to adopt e-learning. Cost considerations include incentives, personnel, marketing, and infrastructure. Many of these are discussed in other parts of this research. In this section the discussion will center on the methods of evaluation and assessment that companies used to determine Return on Investment (ROI).

One of the main difficulties found with quantifying e-learning is the overlap that exists between capital expenses and actual e-learning expenses. This is particularly difficult to calculate if the e-learning unit is integrated with the overall business. IBM (2005) acknowledges that despite the evaluation plans it is difficult to relate learning results with business results. In larger organizations such as GM (2005) self-sustaining universities are set up facilitate individualized calculations of e-learning costs because the unit is separate from the wider organization. E-learning is often part of the larger training budget as shown in the Industry Report 2014 by ASTD. It is hoped that the methods described show ways that organizations can get the information necessary to evaluate e-learning appropriately.

Methods used vary significantly. Ozturan and Kutlu (2010) indicate that Level 1 and 2 are the most used levels in The Kirkpatrick model. Level 1 measures employees' reaction to training, collected by surveys directly after training is complete (Hamtini, 2008; Strother, 2002). While level 2 measures what has been learned. This information can be collected through assessments during the training process. HP Service Workforce Development (HPS WD) in Waight and Stewart (2005b) use mainly level 1 and 2 while levels 3 and 4 are done when needed. This is because levels 3 and 4 are costly to undertake. However, Chuang et al. (2008) were able to use all four levels of Kirkpatrick, making them better able to see the changes in drop out disqualification of pilot rates. In all four cases presented by Waight and Stewart (2005b) pre and post assessments were used to assess learning within courses. Both organizations studied in

Harfoushi et al. (2010) showed high reliance on the LMS for feedback on how employees use the system. In addition Orange used a measure of ROI derived from the original business case that was initially developed for e-learning (Harfoushi et al., 2010).

Many measures described above are designed to track “hard benefits” of e-learning. The “soft benefits” are more difficult to quantify. IBM (2005) has developed a 4 level e-learning strategy which incorporates evaluation of both types of benefit. This includes looking at behavior changes and business impact. Surveys are used internally to determine employee satisfaction with the system (Borotis et al., 2005; McKee, 2006; Proctor&Gamble, 2005). These surveys give ideas about employee interaction with the system and how this can be improved. The variety in measurement methods prompted the idea to include a question “What are your plans for assessment and evaluation of an e-learning initiative?” (Survey A and B). This would help evaluate the plans of the organization for justifying the costs associated with e-learning.

Determining effectiveness of e-learning was a phrase often used in the literature. The difficulty with using the word effectiveness is that it is defined differently in every company (Tai, 2007). (McKee, 2006) describes measuring effectiveness by making videos of associates who have performed, and assessing data collected. Proctor and Gamble (2005) describe effectiveness as meeting the business need. The concept of effectiveness generally loops back to the expectation of achieving organizational goals. As organizational goals and expectations of e-learning are different in each organization then how effectiveness is defined would also be different. Therefore the question “What do you consider e-learning success?”(Surveys A, B and C) was added to the tool so that the expectations for e-learning are explicitly stated.

Given the broad range of methods used to determine financial returns there are some basic considerations that are important for readiness. The organization needs to think of both

costs and savings in relation to e-learning and how these meet the intended goals of e-learning. Therefore questions about past expenditures were added in order to get an idea of the way the company uses its budget. It is necessary to see the expenditure on training as a precursor to what will be spent on e-learning. Despite the difficulties with isolating financial data, finances are the main support for e-learning. It was necessary to include questions about finance in as part of e-learning readiness. Since ROI are essential to organizations adopting e-learning it is necessary for organizations to devise some method of measuring success of the initiative and value returned for the investment. The examples presented above are to show that there are no standard methods, but that something has to be in place, since e-learning requires upfront expenditure that has a long term implications (Chan & Ngai, 2007).

Human Resources

Knowledge management. Knowledge management is a process of creating, saving and reusing organizational knowledge (Chawhan, 2012).. Part of knowledge management is also knowing where knowledge is in the organization. Knowledge management can be beneficial to both managers and individual learners as the information is useful for managers to track learner progress, as a tool for learners to monitor their individual progress as is done at IBM. The questions “What courses have employees taken in the past? What are employees’ levels of education?” was asked on HR surveys, since HR are the ones responsible for tracking employee skills and levels of education. Several organizations used the LMS and other systems to track employee progress, and store and share content used in e-learning as seen in the.

The question: “How is knowledge managed in your organization?” was an attempt to determine whether organizations have knowledge management procedures in place apart from e-learning. Borotis et al. (2005) had fragmented processes for managing training. The

responsibility was shared by three departments who had systems which did not operate in unison with those that stored employee information. This created redundancy with employee information, making it difficult to track employee progress.

People Involved. Who are the people who are going to be involved in the e-learning initiative? There are three sets of people to be considered, the implementers, the learners and the actual personnel needed for adoption. Overall the attitudes of each of these groups contribute to affect implementation of e-learning. Each group has varied concerns and needed skills. Learners will be discussed in the next section. In this section we discuss the implementers and personnel needed for adoption.

Implementers are those responsible for carrying out the implementation of e-learning. Multidisciplinary teams are valuable in planning and adopting e-learning (Hall, 2002). Using only one organizational group or department may result in the final product being skewed toward that group's objectives. Chuang et al. (2008), in application of e-learning to pilot training, state that establishing effective work groups was one of the critical factors for success of e-learning. This is particularly important for key departments like IT and HR who are very directly impacted by e-learning. Hall (2002) states that, while he acknowledges the role of a champion, partnering among various departments helps all to understand the challenges for each department. However the team approach is not always successful if the team members are not knowledgeable about e-learning. Orange in Harfoushi et al. (2010) defined a team for their e-learning project but found the team to be ineffective due to lack of knowledge about and experience with e-learning. In order to remedy this they trained the team outside of their company and hired consultants for advice.

Ely (1990) refers to the importance of implementers having knowledge and skills that help with their understanding of the process and of what is involved in e-learning. None of the case studies focused on the attitudes of implementers as a group but each noted attitudes of key players such as HR and senior managers (Proctor & Gamble, 2005). TAG in Harfoushi et al. (2010) specifically focuses on the need for leaders to have good communication skills. Engeström et al. (2007) recommend a coordinator who is able to move e-learning forward and adapt it to the organization's needs. E-learning champions are defined as individuals who would take a leadership role in the e-learning initiative (Hung et al., 2009; Nakayama et al., 2005). Although champions are people within the organization who support the initiative, they do not necessarily have to be managers. Champions may emerge from among the employees who have satisfactorily completed the first round of e-learning (Chuang et al., 2008). People involved in the implementation of e-learning can serve as champions for adoption. Even though there are few studies on implementer attitudes it is necessary to assess their readiness for e-learning since they are the ones responsible for pushing the initiative.

In the actual adoption of e-learning there are personnel sustaining the initiative. A precursor to determine who will be needed is the answer to whether e-learning content will be outsourced or internally developed. The answer to this question seems to depend on the type of skill that is to be taught and how much customization of content is desired. Several organizations use a combination of both (General Motors University, 2005; IBM, 2005; Waight & Stewart, 2005b).

There are differences in the composition of e-learning teams. The size and purpose of e-learning determine who is involved. The question on the tool presents an opportunity to

inventory the current staff and future projections for e-learning. As with these examples it is expected that the answers would be related to the organization and the resources it has available.

Learners. Learners are expected to be the main users of the system because of this matters related to learners are important. Learners drive the e-learning initiative in several ways. They must be able to access the system, they use the system and they are the beneficiaries of the system. Before developing e-learning courses some organization gain information about learner needs in several ways, for example conducting preliminary needs assessments (Chuang et al., 2008; Harfoushi et al., 2010) and asking employees and managers to submit information about the types of course that learners require to improve their job performance (Borotis et al., 2005; Harfoushi et al., 2010; Waight & Stewart, 2005b). Both methods are useful as they make learners contributors to the decision making process. Preference for learner control was one of the characteristics of adult learners. Since they are in control of other aspects of their lives then control in the learning environment is desirable (Waight & Stewart, 2005a). Learner control can also be achieved though content design. Content can be flexible in several ways: modularized, varied in multimedia options, varied in delivery options and varied in the types of information that are presented in the content. The capacity of modularized content allows material to be delivered in manageable chunks (Womble, 2007). Other forms of motivation, for example incentives, were discussed earlier with relation to finances, but psychological incentives also play a big role in getting learners to use the system.

Learners are influenced to use e-learning when they find that content is applicable to improvement of their jobs. In the case study described in Engeström et al. (2007) the organization tried to standardize all the course offerings by delivering the same content and modules in the same order for four different units. Each unit had different functions. This

standardized approach did not work very well with some units lagging behind others. The results were affected by the lack of relevance of some of the content to some units and the inability to adapt to local unit needs. Engeström et al. (2007) recommends a differentiated approach which will cater to the needs of individual departments. A differentiated approach is also useful for learners. Borotis et al. (2005) found that one of the obstacles to their corporate training functions was the lack of job descriptions. Training could not be adequately tailored to learner needs without job descriptions. Before employees decide to use the e-learning system they consider how it could be useful to them (Lee, Hsieh, & Hsu, 2011). Managers are expected to create avenues for learners to apply newly acquired information (Lim, Lee, & Nam, 2007; Roca & Gagné, 2008). The questions included in Table 30 are aimed at finding out how learners perceive their role of training in relation to their jobs.

Since computer technology is the obviously different factor between e-learning and traditional training learner attitudes and skills with relation to technology become very relevant to e-learning adoption. Technical readiness is the skill associated with being able to navigate and use the e- learning system effectively. Resistance toward the new format is one of the major challenges for users. Harfoushi et al. (2010) state that learners questioned the validity of e-learning compared to other instructional formats. These attitudes toward e-learning come from people's ideas and beliefs about e-learning. It was therefore necessary to add questions to the tool which would determine learner attitudes toward e-learning. "How important do you think technology is to learning? How do you feel about using computer technology for learning (e-learning)?"

Computer self-efficacy is how learners perceive their own skills in relation to computers. Purnomo and Lee, (2013) found that since worker in the bank were used to using computers for

everyday tasks their computer self-efficacy was high in relation to using computers for e-learning. Contrary to this experience, Ettinger and Holton (2005) found that, because staff at the BBC used computers for work, they did not see them as ideal tools for learning. The assumption here is that if learners have prior experiences using computers they should have skills that will transfer to e-learning. However, Schreurs et al. (2008) recognized that even though employees have experience using computers they have little experience using e-learning. This lack of experience initially affected their ability to use e-learning packages. This may suggest that e-learning requires a different type of skill. Chuang et al. (2008) state that employees need to be experienced with advanced qualifications to use web based environments. To determine this they use efficacy and Key Performance Indicator (KPI) evaluations to make learner decisions. Several other organizations devised ways of ascertaining learner “qualifications” with respect to technology competence. Therefore the questions “What is your experience with learning using e-learning? What basic functions can you perform on a computer? How do you use computers now in your daily tasks?” are added to the surveys. These questions also hope to capture information on pre requisite skills and knowledge as well.

Technology

“New” thinking about e-learning shows that the focus should not be primarily on the technology (Adams & Morgan, 2007). “Don’t get caught up in the technology..... Keep it simple and never underestimate how hard the technology will be for someone else” (Proctor & Gamble 2005, p. 124). This statement captures the idea that though technology is important it does not exist in isolation, and related to this are challenges for e-learning delivery. This section will describe the reasoning for the questions included in the technology section of the e-learning readiness tool.

In the case studies reviewed it became evident that connectivity, hardware, software and access are required for accessing instruction. Access affects both learners and content design. Previous sections described the use of several types of formats for content in e-learning delivery. New formats, particularly those rich in multimedia, result in need for increased bandwidth to facilitate download and use of content. Bandwidth issues were a challenge for several companies (Admiraal & Lockhorst, 2009; Borotis et al., 2005; Harfoushi et al., 2010). Bandwidth issues generally posed a barrier regardless of the type or size of the organization. If the learner is unable to access the instruction then no learning can occur. “How will the organization facilitate access to e-learning? What do you anticipate will be the technological barriers to e-learning?” are two questions which are relevant to finding out what the organization’s capacity to in terms of allowing employees to access e-learning. Borotis et al. (2005) state that trainees complained of difficulties downloading instructional material containing high multimedia content at their desk. This is equally important if companies expect learners to carry out e-learning at home, since access physically away from the organization introduces new considerations about connectivity. There are complications with requiring or allowing learning from home, since infrastructure at home may not be as good as at work (Schreurs et al., 2008). This is why the question. “How will you access e-learning?” was included on survey C since access is not only an organizational concern but a learner concern as well.

Maintenance and integration

Using technology that can easily integrate into IT structures that already exist saves cost (Hung et al., 2009). It is both cost effective and easier for future maintenance and updating. Hung et al. (2009) used vendor systems that were able to directly integrate with the existing system. They found adoption barriers included incompatibility with existing systems, complexity

and high costs. Proctor and Gamble (2005) state two challenges to implementation as being overcoming the challenges of amalgamating HR data into the new LMS, and the usability of the LMS. Employees needed to learn the new LMS.

The quality of learner interaction with the system is related to learner willingness use the system. Nakayama et al. (2005) found that continuous technical interruptions during time dedicated to e-learning caused negative attitudes to e-learning. Purnomo & Lee. (2013); Ramayah et al. (2012) found that ease of use had a positive effect on intention to use an e-learning system. “What are your current experiences with maintenance and updates of computer technology?” (Survey C) point to system quality.

The technology should only be decided having establishing the purpose and performance goals. Whatever technology is adopted it must be sympathetic to learners. Heavy investment in infrastructure and software is not always necessary in all contexts, but whatever is used must be reliable and usable by the learner.

Appendix G

Recommendations and Citations Table

Organizational Environment

	Support Systems	Recommendations
Organizational Environment	Organizational Goals Training Plan:	1. Performance goals should be linked to organizational goals which in turn is related to the type of content and choice of technology.(Borotis et al., 2005; Chuang et al., 2008; McKee, 2006) 2. Employees should see the link between their jobs and training within the organization.(Annansingh & Bright, 2010; Derouin et al., 2005; Lee et al., 2011) 3. Any type of knowledge and skill can be taught as long as it takes advantage of the attributes of the medium and addresses performance goals.(Barrow, 2003; Chuang et al., 2008; Derouin et al., 2005; Rosenberg, 2007) 4. E-learning will help with organizational training plan and goals. E-learning can be one of many performance solutions to address performance needs. (Borotis et al., 2005; Dai & Duserick, 2007; General Motors University , 2005)
	Organizational leaders (Leadership/management) Support:	1. Leadership support is key- leaders/managers need experience or understand the e-learning systems to become “champions”, possible orientation for managers.(Borotis et al., 2005; Steenekamp et al., 2012) 2. Managers need to create opportunity for application of learnt material – transfer of learning.(Chen, 2008; Chuang et al., 2008; Schweizer, 2004) 3. It is important to know who make the e-learning decisions in order to know who to ask the correct questions. (Chapnick, 2000; Tai, 2007)
	Learning culture:	1. There should be consensus on the definition of e-learning and e-learning success is required, since e-learning is highly contextualized. Differences lead to confusion in relation to where money is to be spent.(General Motors University, 2005; Proctor & Gamble, 2005; Tai, 2007) 2. A positive attitude toward learning in general (Tai, 2007; Waight & Stewart, 2005b). 3. Employees can see how information is useful to them no matter what the medium.(Engeström et al., 2007; Waight & Stewart, 2005b) 4. Organization can create opportunity for learning. Use both formal and informal activities to connect learning to

	Support Systems	Recommendations
		work E-learning can become part of work conditions.(Chuang et al., 2008; Tai, 2007) 5. Provide incentives in the form of time allocation, promotion and recognition, flexibility of time for studying during the work day, employees play a role in the process.(Chuang et al., 2008; Moshinskie, 2003; Schreurs et al., 2008) 6. Content design can facilitate incentives – modular format, employees can start, stop and return to content at any point. (Waight & Stewart, 2005b; Womble, 2007)
	Initiative adoption:	1. Past responses to change may be indicators of future adoption (Rogers, 2003) . 2. Good communication, promotion and organizational strategies need to be considered – change management plan.(Welsh et al., 2003) 3. Start with a pilot project. Start small. Implement e-learning slowly, begin with a pilot project involving one department.(Ettinger & Holton, 2005; General Motors University, 2005) 4. Sell e-learning from the point of individual gains and benefits.(Allen, 2008; Waight & Stewart, 2005b) 5. Develop a strategic e-learning plan (Proctor & Gamble, 2005; Tai, 2007) 6. System is reliable and of high quality (Schweizer, 2004; Wang, Wang, & Shee, 2007)
	Finance:	1. Calculate both return on investment (ROI) and Return on Expectation (ROE) (Deeny, 2003; Tai, 2007) 2. Consider personnel needed for design & development, administer, technology, manage, maintain and support delivery, distribution and marketing, time in terms of productivity.(General Motors University, 2005; Waight & Stewart, 2005b) 3. An assessment/ assessment plan should be in place to determine whether e-learning has met its objectives.(Harfoushi et al., 2010; Tai, 2007) 4. Weigh employee roles in terms of purchase of hardware/software and payment for e-learning.(General Motors University, 2005)

	Support Systems	Recommendations
Human Resources (People)	Knowledge Management:	1. Good knowledge management of where knowledge is in the organization and who needs it. (Dai & Duserick, 2007; Waight & Stewart, 2005) Tracking employees training progress and skills. This information should be available in HR records. 2. Training policy needs to be updated, to reference and reflect use of technology and set standards for learning accountability. A new training policy should include policies on technology, time and access. (Chuang et al., 2008; Comacchio & Scapolan, 2004) 3. Plan several levels of content to allow employees to reach required competencies. Waight & Stewart, 2005b)
	People involved:	1. Consensus on an e-learning definition allows everyone to move toward the same goal. (General Mortors University, 2005; Tai, 2007) 2. A multidisciplinary approach so that needs of all departments are met. Systems and collaborative thinking (Hall, 2002; Harfoushi et al., 2010; Nakayama et al., 2005; Tai, 2007) . 3. Internal development; personnel with the competencies and skill are available. External development: personnel and skill are unavailable. (Harfoushi et al., 2010; Proctor & Gamble, 2005;. Waight & Stewart, 2005b) 7. Competency test/ pre assessment to establish technical and pre requisite skills. Varying level of content to accommodate differences in competencies and facilitate up grading of skills. (Harfoushi et al., 2010; Waight & Stewart, 2005b; Womble, 2007)
Technology	Access:	1. E-learning should drive the technology/ not the other way around. Technology choice is context specific. (Proctor&Gamble, 2005; Rosenberg, 2007) 2. Technology is of high quality and consistent. (Admiraal & Lockhorst, 2009; Borotis et al., 2005; Harfoushi et al., 2010; Keramati et al., 2011; Purnomo & Lee, 2013). 3. Adopt the simplest form of technology suitable for context, resources and can solve the performance problem (Barrow, 2003; Kearns, 2010) . 4. Employees should have the necessary tools to access e-learning (Becker et al., 2013; Schreurs et al., 2008). 5. Previous computer experience related to better attitudes toward using e-learning (Purnomo & Lee, 2013; Schreurs et al., 2008). 6. Perceived ease of use is related to intention to use computers (Purnomo & Lee, 2013; Ramayah et al., 2012)

	Support Systems	Recommendations
	Maintenance:	1. Maximize the use of current IT infrastructure (Chen, 2008; Rosenberg, 2001). 2. Perceived ease of use is related to continue using technology (Hung et al., 2009; Purnomo & Lee , 2013; Ramayah et al., 2012; Tai, 2007)
		3. IT department should be part of the multidisciplinary team in order to address their concerns. Upgrading of skills may be necessary to accommodate learning technologies (Hall, 2002; Nakayama et al., 2005; Rosenberg, 2001). 4. E-learning technologies should as much as possible be integrated into existing technology in order to reduce cost. Vendors can assist with integration problems.(Hung et al., 2009; Khan, 2005; Newton & Doonga, 2007)

Appendix H

Expert Review Interview Instrument

Content Validity

Learner Readiness Analysis:

Q1: Are learner analysis questions appropriate for determining learner readiness?

Q2: Are the suggested recommendations appropriate for answering learner analysis questions?

Technology Readiness Analysis:

Q1: Are technology analysis questions appropriate for determining technology readiness?

Q2: Are the suggested recommendations appropriate for answering technology analysis questions?

Organizational Readiness Analysis:

Q1: Are organizational analysis questions appropriate for determining organizational readiness?

Q2: Are the suggested recommendations appropriate for answering organizational analysis questions?

General Questions:

Q1: Do you think a weighting scale is necessary?

Q2: What aspects of the tool do you like?

Q3: What aspects of the tool do you disagree with?

Q4: What would be your recommendations for improving the tool?

Q5: Based on your review what is your general opinion of the e-learning readiness tool?

Appendix I
Expert Review Interview Instrument
Construct Validity

E-learning Analysis Tool

Q1: Overall does the tool provide the necessary direction for determining e-learning readiness?
How do the parts fit together?

Q2: How do you think this tool can be used in an organizational setting?

Q3: Do you think a weighting scale is necessary?

Q4: What aspects of the tool do you like?

Q5: What aspects of the tool do you disagree with?

Q6: What would be your recommendations for improving the tool?

Q7: Based on your review what is your general opinion of thee-learning readiness tool?

Appendix J

Recruitment Letter Construct reviewer

Dear _____

My name is Cathy James-Springer. After discussions with my adviser and doctoral committee, it was recommended that I contact you. I am a full time Doctoral student in the Instructional Design and Technology program at Virginia Tech. I am a Fulbright student from St. Lucia in the West Indies with a background in Science Education. I currently work as a GA at Virginia Tech helping faculty design online courses.

I will defend my dissertation during the Spring semester of 2016. My dissertation is a developmental study designing a tool to determine e-learning readiness in organizations. The tool is developed from a literature review and includes suggested questions and recommended solutions for the factors affecting e-learning adoption. The tool reviews readiness from three main factors: Technology readiness: Learner readiness: Organizational readiness.

In order to determine content validity, I require an expert reviewer for each of the readiness factors. You have been identified as a nationally recognized as an expert in Organizational Analysis.

I am aware that you are extremely busy, so this letter is to determine your willingness to serve as expert reviewer. With your agreement to participate in this study. You will be provided with an interview package consisting of a copy of the informed consent form, a copy of the tool, a printable copy of the interview guide. A follow - up video interview will be conducted based on the review criteria to get recommendations and any feedback about the tool. You will have two weeks to review the tool to be discussed in the interview. The interview will semi-structured and the questions will form part of the interview package. The interview will take approximately one hour. At the beginning of the interview, you will be asked whether you have read the consent form, do you have any questions, then ask if they give your verbal consent to participate in the interview. Your participation in this study will not be completely anonymous. Data will be analyzed, reported and described for a doctoral committee and dissertation/publications, using your identity.

I would greatly appreciate your participation in this process. I look forward to your response. Thank you for your kind consideration.

Sincerely,

Cathy James-Springer

Appendix K

Recruitment Letter Content Reviewer

Dear _____,

My name is Cathy James-Springer. After discussions with my adviser and doctoral committee, it was recommended that I contact you. I am a full time Doctoral student in the Instructional Design and Technology program at Virginia Tech. I am a Fulbright student from St. Lucia in the West Indies with a background in Science Education. I currently work as a GA at Virginia Tech helping faculty design online courses.

I will defend my dissertation during the Spring semester of 2016. My dissertation is a developmental study designing a tool to determine e-learning readiness in organizations. The tool is developed from a literature review and includes suggested questions and recommended solutions for the factors affecting e-learning adoption. The tool reviews readiness from three main factors: Technology readiness: Learner readiness: Organizational readiness.

In order to determine construct validity, I require an expert reviewer for to determine the applicability of this tool to real world situations. You have been identified practicing instructional designer.

I am aware that you are extremely busy, so this letter is to determine your willingness to serve as expert reviewer. With your agreement to participate in this study. You will be provided with an interview package consisting of a copy of the informed consent form, a copy of the tool, a printable copy of the interview guide. A follow - up video interview will be conducted based on the review criteria to get recommendations and any feedback about the tool. You will have two weeks to review the tool to be discussed in the interview. The interview will semi-structured and the questions will form part of the interview package. The interview will take approximately one hour. At the beginning of the interview, you will be asked whether you have read the consent form, do you have any questions, then ask if they give your verbal consent to participate in the interview. Your participation in this study will not be completely anonymous. Data will be analyzed, reported and described for a doctoral committee and dissertation/publications, using your identity.

I would greatly appreciate your participation in this process. I look forward to your response. Thank you for your kind consideration.

Sincerely,

Cathy James-Springer

Appendix L

VIRGINIA POLYTECHNIC INSTITUTE AND STATE UNIVERSITY

Informed Consent Form

Title of Project: Building a Tool for determining e-learning readiness of organizations

Investigator(s): Cathy James-Springer, School of Education, Virginia Tech

I. Purpose of this Research Project

This study involves the development of an e-learning readiness tool. The study is a design and development research project. The tool will be designed and developed from a literature review and will then be subject to expert review. This study will provide a tool that can be used to help inform organizations who have or are planning to adopt e-learning of their current level of readiness with regards to e-learning and add to the field by giving a process tool to analyze e-learning readiness that practitioners can easily apply in real world situations. The study will consist of interviews with expert reviewers.

II. Procedures

You will be provided with an interview package which consists of, a copy of the informed consent form, a copy of the tool, a printable copy of the interview guide. A follow - up video interview will be conducted based on the interview guide to get recommendations and any feedback about the tool. You will have two weeks to review the tool to be discussed in the interview. The interview will semi-structured and the questions will form part of the interview package. The interview will take approximately one hour. At the beginning of the interview, you will be asked whether you have read the consent form, do you have any questions, then ask if they give your verbal consent to participate in the interview.

III. **Risk:** There are no anticipated risks to you as a result of participating in this study.

IV. **Benefits:** Several benefits may come from this study. The data and sequential analysis will add to the body of knowledge regarding e-learning readiness. The recommendations generated from the study will be revised. These benefits are speculative and no promise or guarantee can be made. A summary of the results will be provided to you at your request.

V. The extent of Anonymity and Confidentiality:

Your participation in this study will not be completely anonymous. Data will be analyzed, reported and described for a doctoral committee and dissertation/publications, using your identity. It is possible that the Institutional Review Board (IRB) may view this study's collected data for auditing purposes; however, your identity will not be compromised. The IRB is responsible for the oversight of the protection of human subjects in research.

VI. Compensation

Participants will not be compensated for participating in this study.

VII. Freedom to Withdraw

You are free to withdraw from this study at any time: to do so simply close your browser. Further, you may refuse to answer any questions you don't want to answer and still remain in the study.

VIII. Subject's Responsibilities and Permission:

I voluntarily agree to participate in this study. I acknowledge I have the following Responsibilities:

- I have read this "Informed Consent" form
- I will participate in recorded interview.

I have read the Informed Consent agreement. I am 18 years of age or older and I have all my questions answered at this time. I hereby acknowledge the above and give my voluntary consent for participation in this project. Additionally, I am consenting to the interview for the purpose of discussing the tool. I understand that the interview will be recorded. If I participate, I may withdraw at any time without penalty by contacting one of the people listed below. I accept that I have consented to these terms by agreeing to participate, through verbal consent at the beginning of the interview.

Should you have any questions about this research or its conduct, you may contact any of the following:

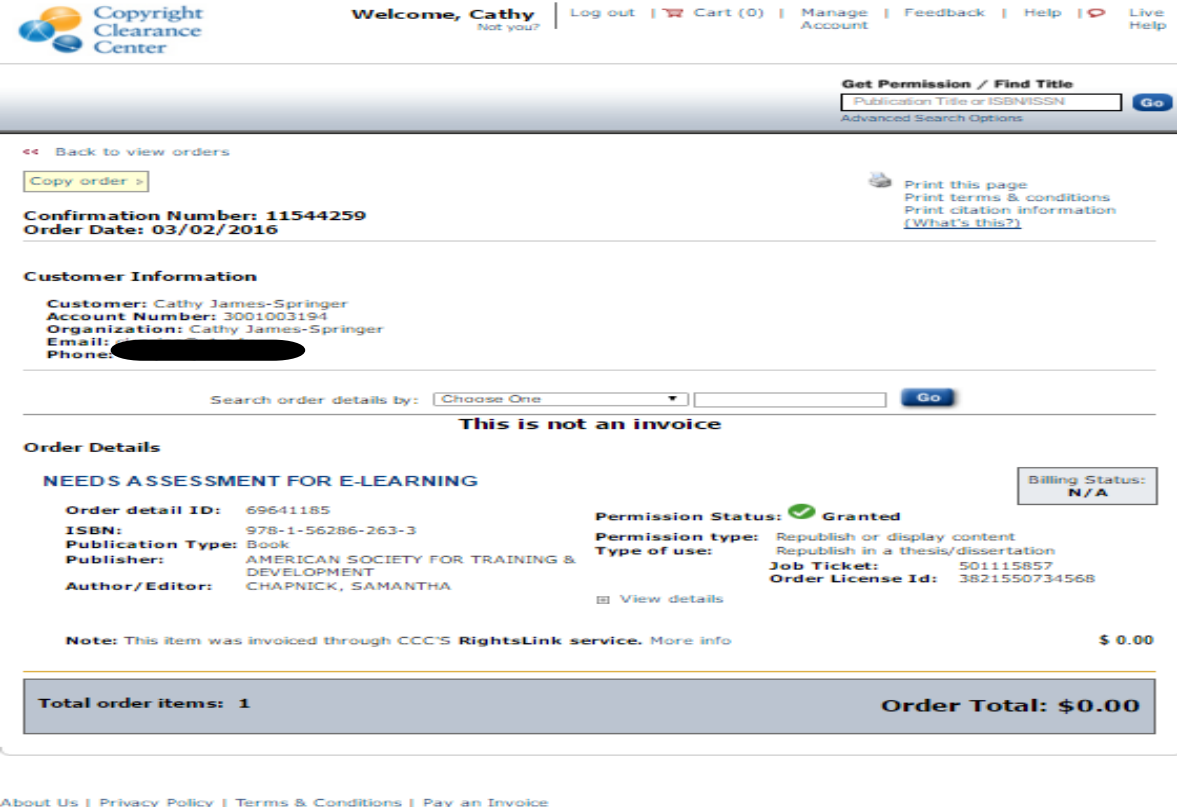
Investigator: Cathy James-Springer – cjspring@vt.edu

Faculty Adviser: Katherine Cennamo – cennamo@vt.edu

Chair, IRB: David M. Moore - moored@vt.edu

Appendix M

Permissions to use Table

Citation	Permission for use
Chapnick, S. (2000). <i>Needs Assessment for E-Learning</i>. Alexandria VA: ASTD.	 The screenshot shows the Copyright Clearance Center (CCC) website interface. At the top, there's a navigation bar with 'Welcome, Cathy' and links for 'Log out', 'Cart (0)', 'Manage Account', 'Feedback', 'Help', and 'Live Help'. Below this is a search bar with the text 'Get Permission / Find Title' and a 'Go' button. The main content area displays a confirmation message: 'Confirmation Number: 11544259' and 'Order Date: 03/02/2016'. It also shows 'Customer Information' for Cathy James-Springer, including account number 3001003194 and organization 'AMERICAN SOCIETY FOR TRAINING & DEVELOPMENT'. A section titled 'Order Details' lists the order ID 69641185, ISBN 978-1-56286-263-3, and the title 'NEEDS ASSESSMENT FOR E-LEARNING'. The 'Permission Status' is 'Granted', and the 'Type of use' is 'Republish or display content'. The 'Order License Id' is 3821550734568. At the bottom, a summary box shows 'Total order items: 1' and 'Order Total: \$0.00'.
Borotis, S., & Poulymenakou, A. (2004). E-learning readiness components: Key issues to consider before adopting e-learning interventions.	Begin forwarded message: From: Cathy James-Springer <cjspring@vt.edu> Subject: Request permission to use diagram Date: February 29, 2016 at 12:28:12 AM EST To: info@editlib.org Hello,

In Richards (Ed.), <i>Proceedings of E-learn 2005: World Conference on E-Learning in Corporate, Government, Healthcare, and Higher Education</i> (pp.16622- 1629). Washington, DC.	I am trying to get permission to use a diagram form the following citation in my dissertation. Borotis, S., & Poulymenakou, A. (2004). <i>E-learning readiness components: Key issues to consider before adopting e-learning interventions</i>. Paper presented at the World Conference on E-Learning in Corporate, Government, Healthcare, and Higher Education. The link on the main page appears not to be working. Can you please direct me to the appropriate place to request permission? Cathy On Mon, Feb 29, 2016 at 10:26 AM, Kathryn Mosby <art@aace.org> wrote: Hi Cathy, AACE grants permission for this use of material, provided you adhere to the copyright policy below: The Association for the Advancement of Computing in Education, (AACE) copyright notice must be displayed on the first page or initial screen of a display of all works copyrighted by AACE, whether those works are published in print or in a digital medium. (Copyrights for components of works owned by others than AACE must be honored.) A person granted permission to copy an AACE work should display the following with the copy: 1) The copyright notice: 2) “Copyright 201x by AACE and the Education & Information Technology Digital Library (EdITLib), www.LearnTechLib.org, included here by permission.” 3) A link or citation to EdITLib’s definitive version. The link or citation will enable a reader to access the context in which the copied material originally appeared. Full copies of the work should also include the full copyright notice, which will normally be part of the work anyway. Please let us know if you have any questions. Kathryn Mosby Graphics & Communications Coordinator AACE - Association for the Advancement of Computing in Education Website: http://aace.org Facebook: http://facebook.com/aaceorg On Mon, Feb 29, 2016 at 10:38 AM, Cathy James-Springer <cjspring@vt.edu> wrote: Hi Kathryn, thanks for your answer, Just to confirm, this is the statement that should appear along with the diagram The copyright notice:
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	2) “Copyright 201x by AACE and the Education & Information Technology Digital Library (EdITLib), www.LearnTechLib.org, included here by permission.” and a citation must be included (this is done anyway in the reference section) Sorry, but every publication has different procedures just want to be sure I get it correct. Thanks Cathy On Mon, Feb 29, 2016 at 10:48 AM, Kathryn Mosby <art@aace.org> wrote: Yes. One slight change. Sorry, I missed it earlier. ““Copyright 201x by AACE and the Learning and Technology Library (LearnTechLib), www.LearnTechLib.org, included here by permission.”
Aydın, C. H., & Tasci, D. (2005a). Measuring Readiness for e-Learning: Reflections from an Emerging Country. <i>Journal of Educational Technology & Society</i>, 8(4), 244-257.	Permission to use content Cathy James-Springer <cjspring@vt.edu> Feb 29 to kinshuk On 29-Feb-16 8:23 PM, Cathy James-Springer wrote: Good day, I am trying to get permission to use a table from the following citation in my dissertation. Aydın, C. H., & Tasci, D. (2005a). Measuring Readiness for e-Learning: Reflections from an Emerging Country. <i>Journal of Educational Technology & Society</i>, 8(4), 244-257. I have read the copyright message on your page and I am a little unclear as to what to do. Do I need to e-mail the author directly or is attribution sufficient? Looking forward to your response. Cathy

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Rogers, E. M. (2003).
Diffusion of innovations (5th
ed.). New York, NY: Simon
and Schuster.



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1230 Avenue of the Americas
Permissions Department, 12th Floor
New York, NY 10020

christine.lee@simonandschuster.com
Fax (212) 698-7284

February 25, 2016

Cathy James-Springer
Virginia Tech
Instructional Design and Technology
cjspring@vt.edu

Dear Cathy,

You have our permission to include Figure 10-3, "Five Staves in the Innovation Process in Organizations", from page 421 of our book, *DIFFUSION OF INNOVATIONS, FIFTH EDITION* by Everett M. Rogers in your doctoral dissertation, "Building a Tool for Determining e-Learning Readiness in Organizations."

The following acknowledgment is to be reprinted in all copies of your dissertation:

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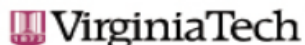
Regards,

Christine J. Lee
Permissions Supervisor

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Appendix N

IRB Approval Letter



Office of Research Compliance
Institutional Review Board
North End Center, Suite 4120, Virginia Tech
300 Turner Street NW
Blacksburg, Virginia 24061
540/231-4606 Fax 540/231-0959
email irb@vt.edu
website <http://www.irb.vt.edu>

MEMORANDUM

DATE: October 1, 2015
TO: Katherine S Cennamo, Cathy Daria James-Springer
FROM: Virginia Tech Institutional Review Board (FWA00000572, expires July 29, 2020)
PROTOCOL TITLE: Building a Tool for determining E-learning Readiness of Organizations
IRB NUMBER: 15-842

Effective September 30, 2015, the Virginia Tech Institutional Review Board (IRB) Chair, David M Moore, approved the Amendment request for the above-mentioned research protocol.

This approval provides permission to begin the human subject activities outlined in the IRB-approved protocol and supporting documents.

Plans to deviate from the approved protocol and/or supporting documents must be submitted to the IRB as an amendment request and approved by the IRB prior to the implementation of any changes, regardless of how minor, except where necessary to eliminate apparent immediate hazards to the subjects. Report within 5 business days to the IRB any injuries or other unanticipated or adverse events involving risks or harms to human research subjects or others.

All investigators (listed above) are required to comply with the researcher requirements outlined at:

<http://www.irb.vt.edu/pages/responsibilities.htm>

(Please review responsibilities before the commencement of your research.)

PROTOCOL INFORMATION:

Approved As: **Expedited, under 45 CFR 46.110 category(ies) 5,6,7**
Protocol Approval Date: **September 10, 2015**
Protocol Expiration Date: **September 9, 2016**
Continuing Review Due Date*: **August 26, 2016**

*Date a Continuing Review application is due to the IRB office if human subject activities covered under this protocol, including data analysis, are to continue beyond the Protocol Expiration Date.

FEDERALLY FUNDED RESEARCH REQUIREMENTS:

Per federal regulations, 45 CFR 46.103(f), the IRB is required to compare all federally funded grant proposals/work statements to the IRB protocol(s) which cover the human research activities included in the proposal / work statement before funds are released. Note that this requirement does not apply to Exempt and Interim IRB protocols, or grants for which VT is not the primary awardee.

The table on the following page indicates whether grant proposals are related to this IRB protocol, and which of the listed proposals, if any, have been compared to this IRB protocol, if required.

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Date*	OSP Number	Sponsor	Grant Comparison Conducted?

* Date this proposal number was compared, assessed as not requiring comparison, or comparison information was revised.

If this IRB protocol is to cover any other grant proposals, please contact the IRB office (irbadmin@vt.edu) immediately.