AN ELECTRONIC LEARNING (e-learning) READINESS MODEL FOR DISTANCE EDUCATION IN THE WORKPLACE

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This thesis is dedicated to my parents

Martin Luther Rautenbach and Cornelia Petronella Rautenbach,

who always supported me through all my years of study,

as well as to my children Karen, Werner and Schalk Labuschagne,

for growing up to be great adults in the midst of all my studies.

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TO GOD ALL THE GLORY

ABSTRACT

This research thesis is about developing an electronic-learning readiness (e-readiness) model for the training of employees in distance education. The overall purpose of the model is to improve current computer-facilitated educational practices in the workplace by enabling e-learning practitioners to plan better for the e-learning event.

There are various definitions of e-readiness, like the ones mentioned by Budhiraja and Sachdeva (2005:4) and the APEC Readiness Initiative (2005:1), most of which refer to readiness in the larger sense, namely of countries' readiness for electronic media use. The context in which the concept of e-readiness is used in this research is similar to the definition cited by Online Reporting Specialists (2005), namely "The state or quality of being ready for electronic learning such as the internet." The context in which it is used is geographically smaller and in line with Hill and Raven's (2000) description, namely it is not limited to physical readiness alone but also includes the non-physical readiness of a business or organisation, e.g. mental readiness as well as organisational cultural readiness.

The literature research explores the inherent characteristics of distance education, Constructivist learning and the use of electronic media for distance education. From the literature research, generic aspects that can influence the readiness for electronic learning in distance education in a workplace are identified and integrated into an initial workplace e-readiness concept model.

The concepts underlying the newly constructed e-readiness model are verified through a quantitative research process, changed according to the findings and further refined. An e-readiness audit model (evidence required for compliance) is designed through a qualitative research process. The final model is tested in the workplace by using a combined qualitative and quantitative research process and the results reported. In conclusion a workable e-readiness model has been developed to be used as point of departure for any vocational educationist when planning, diagnosing problems of or evaluating an e-learning event.

Important recommendations as regards further research are made in respect of the application of the model to relevant fields of study:

- A South African e-learning specialist group should be considered to determine the e-readiness requirements and particularly to focus on e-learning habits and needs in the South African context.
- Further research needs to be done to determine which requirements are appropriate to the various e-learning delivery systems.
- Further research can determine if any criterion of the e-readiness model is more important than others.
- The study needs to be extended to other more diverse workplaces.
- More research needs to be done to determine the needs and requirements of e-readiness of each unique group as an entity within a larger diverse group.
- Further research should consider language barriers by translating questionnaires into the respondents' home language.
- Explanation of computer terminology before the questionnaire is completed is advisable as not all respondents may be familiar with the concepts.
- Further refinement of the audit instrument as well as questionnaires can be done through further research.

OPSOMMING

Die navorsing soos vervat in hierdie proefskrif, handel oor die ontwikkeling van 'n elektroniese leergereedheidsmodel vir werknemers wat afstandonderrig ondergaan. Die oorhoofse doel is om rekenaargedrewe onderrig in die werkplek te verbeter, deur die e-leerpraktisyn in staat te stel om beter vir die e-leergebeurtenis te beplan.

Daar is verkeie definisies vir e-leergereedheid, soos die van Budhiraja en Sachdeva (2005:4) en die APEC Readiness Initiative (2005:1). Hierdie twee bronne verwys na e-leergereedheid in 'n wyer konteks, naamlik die gereedheid van lande om elektroniese media te kan gebruik. In hierdie proefskrif word daar egter na e-leergereedheid verwys in dieselfde konteks as die definisie van die Online Reporting Specialists (2005) naamlik "The state or quality of being ready for electronic learning such as the internet." Die konteks waarin na e-leer verwys word in hierdie proefskrif is nie net geografies kleiner nie, maar stem ook ooreen met Hill en Raven (2000) se beskrywing, naamlik dat dit nie net die fisiese gereedheid vir elektroniese leer is nie, maar ook die organisatoriese (kulturele) of geestelike gereedheid vir e-leer in 'n kleiner opset bv. 'n werkplek.

Die literatuurstudie ondersoek die inherente eienskappe van afstandonderrig, die gebruik van elektroniese media vir afstandonderrig, sowel as die konsep konstruktiwisme as epistemologie vir die Informasie Eeu. Generiese aspekte wat gereedheid vir elektroniese leer in die werkplek kan beïnvloed word in die literatuurstudie uitgelig en saamgevoeg in 'n inisïele werkplek e-gereedheidsmodel.

Die onderliggende konsepte van die inisiële e-gereedheidsmodel is geverifieer deur gebruik te maak van 'n kwantitatiewe navorsingsproses. Die model is verander en verder verfyn op grond van die bevindings. Uit hierdie verfynde model is 'n e-gereedheidsouditinstrument ontwikkel deur gebruik te maak van 'n kwalitatiewe navorsingsproses. Die finale model is in die werkplek getoets deur van kwantitatiewe en kwalitatiewe navorsingstegnieke gebruik te maak. Die resultaat van die toepassing dui daarop dat die model bruikbaar is vir enige beroepsgeoriënteerde opleier en wel op die volgende wyses:

- wanneer daar vir elektroniese leer beplan word;
- vir probleem-identifisering tydens die toepassing van elektroniese leer; asook

- vir die evaluering van die sukses van die e-leerkursus na voltooiing daarvan.

Belangrike aanbevelings vir verder navorsing ten opsigte van die gebruik van die model in toepaslike vakgebiede is soos volg:

- 'n Suid-Afrikaanse e-leerspesialisgroep behoort gebruik te word om die e-gereedheidsvereistes en veral die e-leergewoontes en -behoeftes van leerders in die Suid-Afrikaanse konteks vas te stel.
- Verdere navorsing is nodig om vas te stel watter van die e-gereedheidskriteria toepaslik is by die gebruik van verskillende soorte e-leeraflewerings sisteme.
- Verdere navorsing is nodig om vas te stel watter kriteria van die e-gereedheidsmodel meer belangrik is as ander.
- Die navorsing moet uitgebrei word om meer diverse werkplekke te betrek.
- Dit is ook nodig om navorsing te doen om die behoeftes van elke unieke groep binne 'n groter diverse groep vas te stel.
- Die vraelyste behoort vertaal te word in die moedertaal van die respondente om beter begrip te bewerkstellig en gevolglik die akkuraatheid van die resultate te bevorder.
- Dit word ook aanbeveel dat die rekenaarterminologie wat in die vraelyste gebruik word vooraf met die respondente uitgeklaar word om beter begrip te bewerkstellig.
- Laastens is daar ruimte vir die algemene verbetering van die ouditinstrument en respondentvraelyste.

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CHAPTER 1

INTRODUCTION AND PROBLEM STATEMENT

- **Challenges of the Information Age**

  The development of information-technological innovations that took place concurrently with the arrival of the Information Age increased the possibility of economic growth. To maintain their competitive edge, organisations need to have employees that can keep track of the fast-changing and vast amounts of available knowledge. This results in training challenges as businesses require better skilled employees and must develop them at a faster rate. To be cost-effective, training needs to take place amongst employees that are geographically distributed in the workplace while they are on the job. On-the-job training through e-learning in distance education is the obvious solution (The Costa Rican High Technology Advisory Committee Foundation (CAATEC) (a and b), 2002; Reigeluth, 1996:13; Psycharis, 2005). However, it is essential for careful consideration to be given to e-learning as an option for solving this problem because, as mentioned by Broadbent (2004) and Chapnick (2000), there might be situations where this is not the best solution.

- **Understanding the learning phenomenon**

  Jonassen, Peck and Wilson (1999:2) state, "Formal educational enterprises that rely on the efficient transmission of pre-packaged chunks of information are not natural, yet they are pandemic." This is a problem as the human being naturally chooses to make sense of his environment through his own activities and experiences. Pre-packaging information in the form of training courses in the workplace robs the employee of the opportunity to come to understand the work or his/her world better by not being able to create his/her own new meaning. Sense-making (to make meaning of) lies at the heart of the constructivist philosophy. Constructivism supports the efficient transmission of beliefs and should thus be engaged in the application of technology for creating learning opportunities for employees.

- **The necessity for quality assurance**

  Quality means the "... degree to which a set of inherent characteristics fulfils requirements" (Quality Strategies International, 2003:2). A successful learning event can be predicted if the learning course complies with all the requirements or inherent characteristics of a quality program. To manage the requirements or key elements, so as to ensure that they are present, one needs a quality management system.

  Before one can manage the key requirements or predictors of a successful training event, one should determine the key elements of successful distance education. This will allow the training provider to plan for them and assist in improving the ability of the provider to establish a quality management system so as to ensure better learner satisfaction rates (Quality Strategies International, 2003:2).

- **The need for a comprehensive multidimensional approach**

  There is a multitude of factors that influence a learning event. The Information Age requires customised (according to the users needs) learning, allowing for individualised development of potential and creativity (Cambridge Advanced Learners' Dictionary Advanced Learners Dictionary advanced learners dictionary: 2005). The employer demands creative thinking in solving problems. This requires flexible learning programmes, which open the door for many factors that can influence the learning process. This makes it essential to develop a comprehensive model including all the possible dimensions that can influence the distance education event (Reigeluth, 1996:19; Reeves, 1997).

  Bolman and Deal (1997:12), who advocate a multi-frame thinking approach as research in the human professions is always difficult because it is almost impossible to exclude absolutely all variables and only research one focused area, further support the need for a comprehensive approach. Approaching a research problem from various levels may bring better insight into and new knowledge to the arena. The world is a chaotic phenomenon and cannot be organised, unless one has a mental model with which it can be organised. This is illustrated well by Goran Garstedt's remark (quoted by Bolman & Deal, 1997:2): "The world simply can't be made sense of, facts can't be organised, unless you have a mental model to begin with. That theory does not have to be the right one, because you can alter along the way as information comes in. But you cannot begin to learn without

some concept that gives you expectations or hypotheses". This view is supported by Smith and Dillon (1999a:36) in their systems approach to examine distance education.

Winn (1997) and Jonassen *et al.* (1997:28) make it clear that human beings are unpredictable and that their needs differ. This in turn promotes the need to identify as many elements as possible that can influence employees' learning needs. Jonassen *et al.* (1997:28) specifically argue against isolating specific variables in research as being reductionist, because it is impossible to describe or predict what happens in a learning situation. This trend of thought is supported by the many "no significant difference" findings in research, which further confirm the unpredictable nature of learning. A reductionist approach in distance education research is thus not appropriate. Rather, a multi-framed approach is essential (Jonassen *et al.* 1997:28).

It is therefore the researcher's opinion that multi-frame thinking is essential to understand fully (comprehensively) the range of issues that influences the use of computer technology in distance education. In order to bring order to the chaos of possibilities that can influence e-learning, a comprehensive approach should be followed in order to identify as many predictors as possible of a successful e-learning event.

- **Challenges in determining the predictors of a successful e-learning event**

In order to identify the predictors of a successful e-learning event one can investigate existing tools used to evaluate the success of e-learning and use the results as requirements for the next e-learning event. One can also determine the requirements for distance education and ensure that it is complied with or use existing models to determine the readiness of an organisation for e-learning.

The E-learning Centre (2005) illustrates on the internet E-learning Centre library that there are varying approaches towards determining whether an e-learning programme has been successful or not. Most of these approaches consist of evaluating procedures carried out during or after completion of the event. Different sets of criteria are utilised to predict success of the learning event by different auditors.

The problem with this is that most of the auditing instruments are after-the-effect instruments. Learning programmes are audited after they have taken place. This means that changing the programmes immediately to eliminate possible negative influences is not possible until after an event has been completed. Another problem is that there is no uniform single set of criteria used by all auditors for assessing the quality of the learning event. The reason could be that a set of uniform criteria has not yet been defined, or that as Reeves (1997) argues, the focus is more on computer-based education development than on computer-based education efficiency. He summarises their shortcomings as follows:

* the technological innovations are believed to be effective because they are advertised and marketed as effective;
* evaluation efforts have often been reduced to considering numbers as a reflection of the quality of computer-based education. Quantitative data such as the amount of money spent on computer-based education are used to indicate the efficiency of computer-based education;
* the inadequate format of reports of the evaluations that did take place. The reports were written for academic use and their use by employers or the general public was not considered. This made them difficult to use for practical everyday purposes;
* the use of traditional empirical evaluation methods comparing one innovation with another, assuming that the treatments (type of computer-based education) used are holistic cohesive entities with meaningful differences just because they have different names. No attempts were made to discover the pedagogical dimensions of the treatments to verify the so-called differences before comparing them. In other words, apples were compared with pears;
* lastly, all the key elements that influence distance education have not yet been identified. Without these elements an accurate evaluation of the learning event cannot be done (Reeves, 1997).

Although Reeves gives reasons why existing models are inadequate, he is of the opinion that his own multi-perspective pedagogical approach is still lacking essential dimensions that can influence the training event. He does not consider

specific organisational, technological or human-learning readiness as factors that can have an effect on the success of the learning event (Reeves, 1997).

Alternatively, to determine the predictors for e-learning readiness one can also investigate research already done on what makes distance education successful. However, as research focuses on one or two specific areas of distance education, one finds a division of findings and a non-integration of results in what should be used as predictors of successful distance education. In order to arrive at a comprehensive e-readiness model with most of the requirements necessary to ensure a successful e-learning event, one should consider all the possible factors that can influence distance education. Similarly, research on the learning theories opens up a minefield of theories and recommended approaches, thereby making choices as to what route to follow in order to ensure success of the e-learning event unmanageable for the training employee and the learning employee as far as decision-making on e-learning is concerned (Duchastel, 2003a).

There are many examples of failed e-learning events (Hill & Raven, 2000). A similar experience at the researcher's workplace brought about the realisation that there is a great need for the development of a holistic e-readiness model for the training of the employee in distance education. Just having all the technological hardware and software available for learning is not enough to start an e-learning course.

In preparation of this study, thirteen existing e-readiness models (before the e-learning event) were evaluated, as well as two e-learning evaluation models (after the e-learning event). The evaluation – after the e-learning event – models is useful because the results can be built into the e-readiness models that can assist an organisation in better preparing for the event. In the models used, the after the e-learning event evaluation models as well as e-readiness models reflected the same basic themes.

The 15 models evaluated are the ones of Chapnick (2000), Minton (2000), Rosenberg (2000), Hill and Raven (2000), Mediapro (2001), Anderson (2002), Hughes and Atwell (2003), Worknowledge (2004), ITPreneurs (2004), Borotis and Poulymenakou (2004), Psycharis (2005), Hall (2005), Broadbent (2005), Figueira (2005) and Aydin and Tasci (2005). All of these models followed the same basic themes, namely a grouping of content that belongs to specific areas, e.g.

technology readiness, human resource readiness, etc., but the contents of the categories of the various models are largely the same.

Although these models add value in sorting a wide range of information that needs to be determined before one can start with e-learning, several inadequacies still exist, namely:

* Its application in second- and third-world countries or conditions is questionable as the approach of these models is that of a user being knowledgeable enough to understand the questions, which is definitely not the case in these countries (Aydin & Tasci, 2005:245). Assumptions that the models will be correctly understood and applied in the whole of an organisation is not realistic, as there may be particular areas in an organisation where e-learning is not understood and will not necessarily be the best choice for training delivery (Broadbent, 2005);

* the decision to use e-learning as the tool of choice for training delivery has already been made and not enough attention is given to whether it is the right one or to whether the organisations should not stick with face-to-face training. Only Chapnick (2000), Hall (2005) and Minton (2000) point out that before e-readiness can be measured, a decision should be made on whether or not it is the best choice of training delivery;

* a lack of attention to pedagogical requirements and epistemological approaches related to adult training needs, as well as to requirements to overcome the lack of face-to-face contact in the training design, is evident;

* a blanket approach assuming that the organisational readiness will automatically apply to smaller business units and particular training events within the organisation;

* its application because it is designed to be used before the e-learning event starts and not during or after the event, where a tool for determining of problem areas might be useful;

* the people who are supposed to answer the questions of these models are either managers or are not specifically indicated, leaving the trainer as specialist in his field and the learner-user as important stakeholders out of

the picture. The latter can lead to a skew assessment based on the opinions of the managers alone;

* the questions do not require specific evidence and the answers are open to interpretation, and thus based on the perception of managers, and might not necessarily be the truth;
* some of the models do not have a specific measuring tool and make use of open-ended questions, the answering of which is to be judged by the user himself, who may not be that knowledgeable;
* there is no common point of departure or basic training philosophy framing the models, resulting in a lack of congruence between the various models, making it difficult for the user to determine which model is the right one; and
* some of the models are too simplistic and do not accommodate all the areas that need to be ready before one can start with e-learning.

What is needed is a model for e-readiness that

* is user friendly, accommodating the possible lack of knowledge among the users of e-learning;
* considers the bigger picture of the organisation, e.g. the culture, but which also accommodates specific areas of training and people where e-learning is not the best choice for learning;
* accommodates enough information so that it assists the user in making an informed decision on whether to make use of e-learning;
* accommodates a specific training epistemology and pedagogical requirements necessary for adults and specific techniques to overcome the distance between the trainer and the learner during e-learning;
* accommodates specific smaller training events and does not generalise;
* can be applied anytime before during or after the e-learning event so that it can operate as a model to:
    - determine e-readiness;

- act as a diagnostic model that can pinpoint problem areas in existing e-learning events; and
- act as an evaluation model determining the overall success of the event;

* accommodates participation of the most important stakeholders, namely learners, trainers and managers;
* requires specific evidence of readiness and is not based on perceptions only;
* makes use of specific tools to be used as readiness auditing instruments;
* uses one point of departure or central training philosophy as framework for the model instead of just organising a wide array of obvious information necessary into a groups; and
* looks at the e-learning training event holistically, accommodating most if not all of the critical areas necessary considering one basic training philosophy to be maintained.

All the above-mentioned criteria make it very difficult for the average employer – who in the vast majority of cases is not an education specialist in electronic learning – to choose a model that they understand, so as to determine what they need to accomplish when attempting to start with or execute an electronic learning event.

- **The changing roles of the learner, the educator and the training provider**

Distance education as well as face-to-face education has changed. The move towards outcomes-based education principles necessitates a different role from the learner and the educator. The learner must have more autonomy and must control his own learning event whilst the educator is no longer a teacher (someone who gives knowledge) but becomes a learning facilitator (someone who enables or makes something possible) (Cambridge Advanced Learners' Dictionary Advanced Learners Dictionary, 2005; Van der Horst & McDonald, 1997:7).

A large number of the adults of today, having been passive learners from the traditional classroom setup, did not experience learning environments where they were in control and active. As a result, they tend to struggle when placed in a

position where they have to be active and control their own learning. Similarly, the educator, who is used to an instructive role, finds it difficult to stand back and become a learning facilitator.

The organisation's role in training has also changed in the sense that it must adopt a more human approach in delivering distance education. It can no longer be very prescriptive as regards the sequence of events of learning as the learner requires more control over the learning event.

A problem arises if providers and users of the distance education do not understand and plan for these changed roles. It cannot be assumed that the learner or the educator will know how to adopt these roles.

It seems necessary to develop a model for distance education that will assist the provider in determining what planning needs to be done in order to prepare the employee, the educator and the organisation for the learning event.

Considering all the arguments mentioned, it is evident that a possible solution for providing for the employee's and the employer's training needs lies in the comprehensive use of computer technology for distance education. It is a fact that this technology can deliver the training to a large variety of professionals at any time anywhere, boosting the economic growth of the company. What is not evident is how to deliver distance education considering the individual learning differences, the need to create an individual learning experience, how to provide learner control, as well as setting up an effective system of delivery that will ensure that all variables are managed well so that the employer benefits from the effort.

The research question, therefore, is –

How is a quality distance training event for the various employees and the employer in their different settings to be ensured.

The researcher is of the opinion that a model is required that will highlight most or – if possible – all the elements that can influence the quality of the employee's distance education. These elements need to be identified and compiled into a model for distance education for the employee, so that the employer as provider can plan for or manage existing distance education to the best possible benefit of the learner as well as the organisation.

1.1 AIMS OF THE STUDY

Purpose statement

The purpose of the study was to develop a holistic electronic learning readiness model for the training of employees in distance education that provides for training in the workplace, identifies the influencing factors, and from there establish criteria with which such a training event has to comply in order to ensure success.

The model would be grounded in existing themes identified in the literature review, and new themes identified as part of a quantitative research process done with stakeholders of distance training.

1.2 THE RESEARCH DESIGN (RESEARCH OBJECTIVES, METHODS AND SEQUENCE OF EVENTS)

The objectives of the study were as follows:

- To explore the research title "An **electronic learning** readiness model for **distance education** in the workplace" by doing a literature review on:
  - Distance education;
  - how meaningful learning takes place; and
  - the use of computer technology as a tool for delivery of distance education;

  Research method: qualitative – literature review of articles, research and books.
- To compile an initial integrated multi-perspective e-readiness model for distance education of employees based on the literature review as well as the insights of the researcher;

  Research method: qualitative – identify common trends in literature review, organise and categorise (analysis and synthesis).
- To verify the conceptual framework through using a quantitative research method in an online global instructional technology community;

  Research method: quantitative and qualitative – online internet questionnaire (Likert scale and open-ended questions to determine possible unidentified elements)

* Sample: purposive sampling by choosing a specific group of people with the same interests and experience in e-learning in educational environments. A phenomenological approach is applied in determining the population of the study. It includes the experiences of users and providers of computer-assisted distance education. It also includes the views of specialists in information technology and instructional design. The people involved are learners, educators, organisations, distance-education specialists, instructional design specialists and information technology specialists (Columbia Centre for New Media Teaching and Learning, 2004; De Vos, 1998:198; Polit & Hungler, 1999:296–300).
* Data analysis method: Describing univariate data, central tendencies, spread of data and graphs (Rice Virtual Lab in Statistics, 2004); working with a group sharing the same interests in e-learning, central tendencies indicate where most of the preferences of choice lie. The open-ended data are scrutinised for possible unidentified elements, which will be added to the initial conceptual framework. Describing bivariate data is also used, namely cross tabulation. The significance of relationships is determined using the phi-coefficient (Steyn, 2002:10–15; Huysamen, 1998:41; Steyn, Smit, Du Toit & Strasheim, 2000:96–114).

- To change, align and refine the model in accordance with the findings of the initial research;
- To expand and refine the model into an e-readiness audit model by compiling specific evidence needed to comply with requirements of the conceptual framework;

  Research method: qualitative – based on literature research.
- To verify the e-readiness audit model within a specific workplace;

  Research method: qualitative – data gathering through face to face focus group (Market Navigation Inc., 2005; De Vos, 1998:313–326):

  Sample: Purposive – training officers of the specific workplace where the final model is applied and tested.

- To apply the model in the workplace where e-learning is in use by doing an audit (qualitative) and letting participants (learners, facilitators and managers) complete questionnaires (quantitative);

  Research method: qualitative and quantitative:

  * Qualitative – face to face interviewing of a specific course's manager, facilitator and physical evaluation of e-learning courses used (audit); and
  * Quantitative – questionnaires to be completed by employees, facilitators and managers of an e-learning event (Likert scale):
    - Sample: Quota sampling is used by getting a representative sample of employees who are using the particular e-learning event (De Vos, 1998:199); and
    - Data analysis: Describing univariate data – central tendencies, spread of data and graphs as well as bivariate data analysis with cross tabulations and determination of practical significances of relationships (Rice Virtual Lab in Statistics, 2004; De Vos, 1998:202–223).
- To draw conclusions and communicate the results to the relevant parties.

Since the aim of the study was to develop a distance education model grounded in theory derived from the literature review and a combination of qualitative and quantitative research, it was difficult to formulate a hypothesis as the research process followed was an evolving one that involved discovering knowledge as it was explored. The most appropriate hypothesis was that there were no acceptable distance education models for employees that would ensure a quality training event, and the intention was to compile such a model as a framework for the planning of such training events.

1.3 ASSUMPTIONS

In the design of a model for distance education, it is assumed that the learner is the central, most important person for whom the model is designed, and that learning is the core activity that the model must support. The training provider and the educator are not central to the learning process but they influence the process directly.

It is assumed that the concept of distance education incorporates training towards a specific skill or job as is specifically the case in workplace environments.

It is further assumed that the best possible epistemology ("the part of philosophy that is about the study of how we know things." (Cambridge Advanced Learners' Dictionary, 2005)) to follow in the provision of distance education is a constructivist approach. The former Industrial Age behaviourist learning approaches (passive learning) do not produce the type of individuals needed in the current Information Age, namely people who can solve problems and bring diverse perspectives to the workplace. In order to do that, one should move away from instruction of knowledge to the construction of knowledge, thus following a constructivist philosophy in training delivery (Reigeluth, 1997:14).

In order to allow the model to be applied in as many e-learning situations as possible, the researcher assumes that there are requirements for e-learning that will apply to all of them, irrespective of the type of e-learning delivery system used. Once the generic criteria are established, one can always adapt the model according to the specific abilities of the delivery system used by a particular workplace.

1.4 ETHICAL CONSIDERATIONS

All participant information was treated with the necessary confidentiality and all procedures for consent were followed. An ethical problem that may have influenced the research results was sensitivity among learners to disclose their true opinions and unhappiness regarding learning programmes due to possible discrimination by the workplace providing such programmes. Providers may have been sensitive to stating their views, fearing the scorn of fellow professionals and of their own employers. In order to avoid these possibilities and to ensure participants of confidentiality, research questionnaires were completed anonymously.

1.5 STRUCTURE OF THE THESIS

The thesis is divided into the following chapters:

Chapter 1: Introduction and problems statement, summary of the research topic and design

Chapter 2: A literature review in distance education

Chapter 3: A literature review of the Constructivist epistemology

Chapter 4: A literature review on e-learning

Chapter 5: Implementation and discussion of findings of the research.

Chapter 6: Recommendations and conclusion

1.6 CONCLUSION

This chapter outlined the problems resulting in the need to establish a holistic e-readiness model for the training of employees in distance education and the method followed to develop a model for distance education in the workplace. It ended with a description of the various chapters of this thesis.

Chapter 2 will provide a literature review on the various theories on distance education.

CHAPTER 2

TOWARDS A THEORY IN DISTANCE EDUCATION

2.1 INTRODUCTION

In Chapter 1, problems in delivering training at a distance have been highlighted. It is clear that to ensure a positive learning experience in a workplace one must identify all the possible criteria that can influence the event and try to control it by planning for it. There are many types of e-learning the technological abilities of which can easily distract educationists from the real issues that need to be focused on. It is the researcher's opinion that a quality learning event can be planned for through the development of a readiness model by first of all investigating the most prevalent generic theme present in all forms of e-learning, namely the concept of distance education. In this chapter the concept of distance education will be explored so as to identify core elements that need to be part of the make-up of an e-readiness model for distance training in a workplace.

The concept of distance education is inherently part of e-learning, to such an extent that it is considered to be self-evident (Ragan, 1999:20). The obviousness of the implication of distance education as electronically delivered plus the overshadowing of this delivery system by technology tends to hide the fact that this form of education at a *distance* has unique attributes. A misunderstanding of or ignoring these "distance" attributes in the delivery of any distance education will harm the learning process. It is therefore necessary not to focus on the technology part of distance education in this chapter but on the distance theory part of distance education.

2.2 HISTORICAL BACKGROUND OF DISTANCE EDUCATION

2.2.1 Origin of the term distance education

The term "distance education" originated from its use by a Swedish educationalist Börje Holmberg. He called it "Fernstudium". He started his career in research and distance teaching in 1955 at one of the world's largest distance teaching institutions, Hermods

Correspondence School in Malmö. It became known among English-speaking scholars in 1986 due to the efforts of Desmond Keegan (Davey, 1999:44–45).

2.2.2 The three historical generations of distance education since 1720

The development of distance education can also be divided into three generations, each characterised by the particular medium chosen to deliver the education. The first generation that started as early as the 1720s is characterised by correspondence that took place through printed material and study guides. The second generation started with the appearance of the Open University that used printed material combined with other media like broadcast television, radio and teleconferencing. With the arrival of computer conferencing networks and computer-based multimedia, the third generation of distance education was introduced and is still in progress (Holmberg, 1995:47–52; Mackintosh, Waghid & Van Niekerk, 1997:59; Schrum, 1999: 11).

2.3 KEEGAN'S ANALYSIS OF DEFINITIONS OF DISTANCE EDUCATION

Distance education is not a new phenomenon and not exclusively used by tertiary institutions. It is also not alien to traditional classroom training, considering that homework can also be considered as distance education (Davey, 1999:44).

Since theoreticians are still struggling to come to an intellectual grip with a theory underpinning the practice of distance education, defining it is very difficult. Several attempts at defining it have been made (Mackintosh, Waghid & Van Niekerk, 1997:50, 54).

In order to identify the core components of distance education, Keegan (1980:15) analysed the characteristics of distance education by identifying key components in existing accepted definitions by well-known researchers and institutions in this field, namely the ones from Holmberg (1977), the French government (Keegan, 1980), Otto Peters (1992) and Moore (1973).

The definition of Holmberg describes distance education as follows: "The term 'distance education' as used in this survey covers the various forms of study at all levels which are not under the continuous, immediate supervision of tutors present with their

students in lecture rooms or on the same premises, but which, nevertheless, benefit from the planning, guidance and tuition of a tutorial organization" (Holmberg, 1977:9; Keegan, 1980:13; Keegan, 1996:42). Two fundamental elements in this definition are the separation of educator and learner and the planning of education through an organisation. The organisation links the learning material with effective learning by learners and thus distinguishes itself from private study. Private study as such is not organised by an institution (Keegan 1980:15).

The French government passed a law in 1971 in order to regulate distance education. It reads "Distance education is education which either does not imply the physical presence of the educator appointed to dispense it in the place where it is received or in which the educator is present only on occasion or for selected tasks" (Keegan 1980:13). The prevailing element of separation between educator and learner is present and a new dimension, namely the possibility of contact sessions between the educator and learner, are highlighted (Keegan 1980:15).

Peters says: "Distance teaching/education (Fernunterricht) is a method of imparting knowledge, skills and attitudes which is rationalized by the application of division of labour and organizational principles as well as by the extensive use of technical media, especially for the purpose of reproducing high quality teaching material which makes it possible to instruct great numbers of students at the same time wherever they live. It is an industrialized form of teaching and learning" (Moore, 1990b: xiv; Keegan, 1980:13; Keegan, 1996:41).

Peters (1992:29-33) states that distance education differs from face-to-face teaching and the differences, which are not coincidental but structural, can be seen on various levels, from educational policy, educational administration, learner needs and new media and learning behaviour. Politically, governments have to provide for the greater demand of learning through making use of policies promoting distance education as a means of providing teaching. Administratively, it has to cater for a widespread group and has to organise itself in a central governing organisation with or without lesser governing centres. It also brought about a change from young learners to older learners who have a need for continuous life-long learning to enhance their professional careers. Teaching also changed from oral direct teaching to mediated indirect teaching with the educator as manager of a learning system rather than a lecturer of content (Peters, 1992:29–33).

He poses the role of the educator as different from the classroom educator, since the effectiveness of teaching depends on the use of mechanisation and automation methodology in the preplanning of educational material. Peters characterises the relationship between educator and learner in distance education as an impersonal one controlled by technological rules. Learners' needs are identified and direction is provided for with the use of emotion-free language. Goals are achieved through efficiency and not by expectations built by means of personal interaction (Keegan, 1980:16–17). Peters' definition emphasises an aspect of distance education that cannot be left out of any definition, namely that distance education is the most industrialised form of education (Keegan, 1980:19).

Moore and Kearsley define distance education as a planned learning event occurring in a different place than teaching does. Special techniques of course design, instruction, communication and other technology are needed. It also requires special administrative and organisational arrangements (Mackintosh, Waghid & Van Niekerk, 1997:101).

Moore describes distance education as follows: "Distance teaching may be defined as the family of instructional methods in which the teaching behaviours are executed apart from the learning behaviours, including those that in a contiguous situation would be performed in the learner's presence, so that communication between the educator and the learner must be facilitated by print, electronic, mechanical or other devices." (Moore, 1973:664; Keegan, 1980:13).

In Moore's definition three elements can be identified, namely separation, the use of technical media and the possibility of two-way communication. Analysis of the teaching element distinguishes face-to-face teaching as an event where the preparation is done in the absence of the learner but the teaching is done in his presence. In distance education the preparation and the teaching itself happens in the absence of the learner (Keegan 1980:15–16).

Through analysis Keegan identified six components that cannot be left out of any definition of distance education. The elements are:

- Differentiation from face-to-face learning through separation between educator and learner;
- separation from private study through the use of an educational organisation;
- the use of printed material and technical media to carry the educational content;

- two-way communication so that the learner can benefit and if needed initiate dialogue;
- occasional meetings for didactical or socialisation purposes; and
- radical separation of distance education that distinguishes it from face-to-face education, through the use of an industrialised process in delivering the education (Keegan 1980:33).

Besides the position where distance education is seen as structurally different from contact forms of education and therefore unique, there are also positions where distance education is seen as being anywhere on a continuum between being purely distant to the purely contiguous system. Rumble (1989:19) is a supporter of the latter position. This position leads to the blurring of the distinction between distance education and contact teaching. This diffusion of pure difference is further enhanced by the use of technological advancements which reduced the physical distance and increased communication to such an extent that one can state that the distance learner, like the contact learner, has an equal opportunity of contacting the educator (Mackintosh, Waghid & Van Niekerk, 1997:66–65; Rumble, 1989:19).

The United States Distance Learning Association defines distance education as acquiring knowledge and skills at a distance through the mediation of information, instruction, technologies and other forms of learning (Black, 1998:36).

More recent definitions of distance education significantly include technology as a means of delivery of distance education. Moore's definition (1990a) changed from his original to "Distance education is all arrangements for providing instruction through print or electronic communications media to persons engaged in planned learning in a place or time different from that of the instructors."(Keegan, 1996:43; Moore, 1990a:15).

Portway and Lane (1994) define distance education as "... teaching and learning situations in which the instructor and the learner or learners are geographically separated, and therefore, rely on electronic devices and print materials for instructional delivery. Distance education includes distance teaching – the instructor's role in the process – and distance learning – the student's role in the process" (Portway & Lane, 1994:195).

Dabbagh (2005:12) defines distance education as " ... the deliberate organization and coordination of distributed forms of interaction and learning activities to achieve a shared goal." She also illuminates five attributes that apply to the definition, namely:

- learning as well as globalisation are social processes inherent to distance education and it is enabled by telecommunications technology;
- sustained learning can be only be achieved by learning groups;
- the concept of distance is not necessarily a physical one between the learner and the instructor, and is not as important;
- teaching and learning happen over time and in different places, either synchronously or asynchronously, by the use of media;
- learners are engaged in multiple forms of activities, not just among themselves as a group, but also with the instructor, content and individual learners.

Dabbagh and Bannan-Ritland (2005:12) describe five pedagogical models that support this definition of distance education:

- Open (flexible) learning

  This model does not focus on a pre-established curriculum but rather on the learners' needs at a particular moment. The key to this approach is learner-centeredness and learning rather than teaching new knowledge (Dabbagh & Bannan-Ritland, 2005:12).
- Distributed learning

  This implies learning, any place, any time, by the use of various technologies. It can take place in off-site environments and can be done at the learners own pace (Dabbagh & Bannan-Ritland, 2005:12–13).
- Learning communities

  Learning communities consist of groups of people supporting each other in reaching the same learning goals. There is a more informal sociocultural exchange that assists in new learning and gaining experiences. The exchange takes place amongst learners as well as with the facilitator around a central theme (Dabbagh & Bannan-Ritland, 2005:13).

- Communities of practice

  This model includes people who share the same interests, experience and passions. The maintenance of this group is dependent on the members' interests, own choice to participate and knowledge, rather than on a higher authority, e.g. a facilitator (Dabbagh & Bannan-Ritland, 2005:13).

- Knowledge-building communities

  In this pedagogical model communication is seen as generative and transformative, leading to new knowledge. They (the learners and the facilitator) share a common goal of being committed to invest their resources so that they can come to a point of understanding (Dabbagh & Bannan-Ritland, 2005:14).

  Despite several attempts to define distance education and many research projects on distance education, the theoretical underpinnings of this method of education is far from solid (Harry, John & Keegan, 1993:2).

2.4 TECHNOLOGY CHANGED THE NATURE OF DISTANCE EDUCATION

Until recently, distance education was seen as an inferior form of education that cannot possibly have the same benefits of face-to-face education. The ideal in universities was to have small groups of twenty learners per educator to optimally make use of the educational event. This has changed drastically since pressure from governments created budgetary crises which forced educational institutions to teach more people with less money. Besides the budget constraints, society came to the conclusion that one cannot enter the job market without an academic schooling. This increased the demand on universities to teach increased numbers of learners which come from various age groups in society. Universities ended up with classes filled with numbers of two hundred learners and more. The quality involved in the numbers and the quality of real contact that enhances learning were now questioned. Distance education was consequently considered more seriously and with less skepticism than was initially the case (Kirby, 1993:69–70).

Simultaneously the delivery of distance education changed due to the growth in technology, and consequently an evolution in the way it was practiced. Technology increased the quality of two-way interactions between the learner and the training institution. The improvement caused a challenge as the question arises whether the

'distance' in distance education still exists, since the distance learner's opportunity to communicate with his educator is equal to that of the classroom learner (Kirby, 1993:70).

Two movements developed simultaneously. On the one hand universities increased their capabilities to provide distance education and started abandoning their views on traditional delivery of face-to-face education. On the other side they started improving and broadening their capabilities through the use of technology. These two forces are starting to make the notion of distance as applied by universities in distance education irrelevant (Kirby, 1993:71–72).

Kirby (1993:71) demonstrates this well in his conceptualised model of instruction. This model has four dimensions and any course can be placed somewhere on the axes of the model.

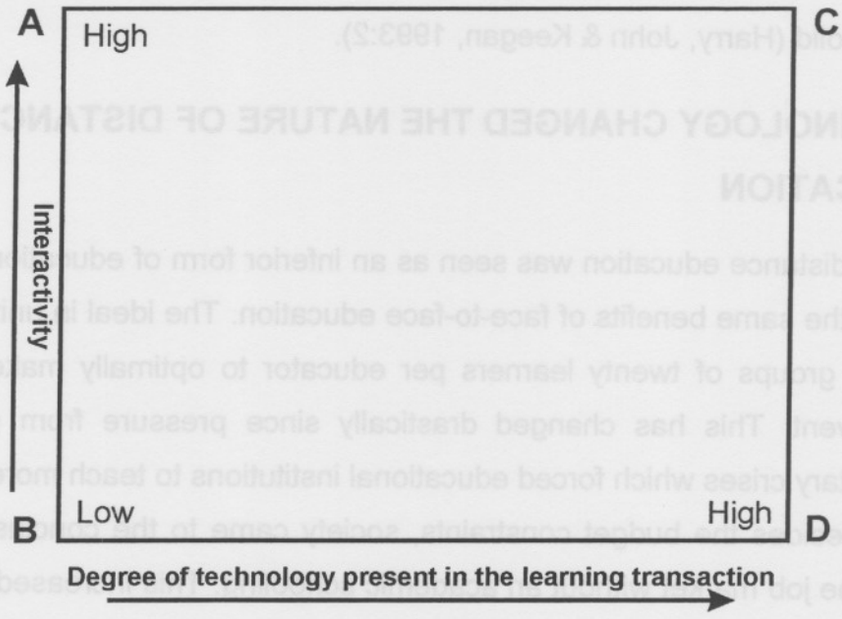


Figure 2.1 Kirby's conceptualised model of instruction

The four corners of the model represent:

A: a small traditional face-to-face course in traditional mode

B: a large course with little interactivity (could also be a poorly taught small face-to-face course)

C: an on- or off-campus course with a high degree of interactivity and high degree of technological support

D: an on- or off-campus course with a high degree of one-way technological instruction.

Kirby (1993:71) continues that the word "distance" should be removed from this method of education as it feeds the misperception that distance education is of a poorer quality than face-to-face education. Labelling the educator as a distance educator also perpetuates this misperception and one should rather refer to them as educational technologists or learning specialists (Kirby, 1993:69–72). However, the use of terminology does not influence the quality of training, it is the lack of understanding of distance education that causes incorrect application of training methods, causing perceptions that distance education is of poorer quality. Some learners also prefer face-to-face training, not because distance education is considered of poorer quality, but because they do not possess the self-discipline required when attempting distance education. The distance educator is not considered to be of a poorer standard than the classroom facilitator.

2.5 DISTANCE EDUCATION AS DIFFERENT FROM TRADITIONAL EDUCATION

Five inherent elements of distance education distinguish it as different from traditional education.

- Unlike traditional education where teaching happens through direct contact and success often depends on the rapport the educator can build with the learner, distance education is executed by the organisation and teaching becomes institutionalised.

- Linking the learner with the learning material becomes one of the main goals of the organisational structure. This 'intersubjectivity' is central to traditional teaching and due to this factor; the teaching and learning process is automatically set up. In distance education there is no guarantee that once the learning material has been delivered to the learner learning will take place. That link must be specifically planned for. Reintegration of the teaching act is attempted in two ways in distance education. First, the learning material is designed to achieve as many of the characteristics of interpersonal communication as possible. Secondly, some form of communication is set up ,whether it is correspondence, telephone conversation, e-mail, video, direct contact sessions or other means to interact (Keegan, 1990:328–329; Keegan 1992:83–84).

- To combat the historical non-starters and drop-outs that have been a prominent feature in distance education, learners with greater independence in the initiation and maintenance of their studies is required. This phenomenon is more prominent among adult learners (Keegan, 1990:331; Keegan 1980:19–20).
- Educational administration is characterised by industrialisation of processes. Considerable preplanning must be done with regard to meeting deadlines, print runs, dispatch, etc., sometimes years before the actual teaching is done (Peters, 1989:46–47; Keegan, 1980:9).
- Distance education can easily lead to depersonalisation of educators and learners. The absence of learners can create a strained atmosphere for academic staff and creative writing, and marking of work can become problematic. Distance education has a definite tendency to cause staff disillusionment (Keegan 1980:8).

These characteristics make distance education unique because these barriers need to be eliminated by special educational techniques in order to ensure that the learning event is successful. The same barriers exist with e-learning and specific strategies must be followed to counter the negative effects caused by the distance between learners and their educator.

2.6 THEORIES IN DISTANCE EDUCATION

2.6.1 Why the need for a theory?

It is necessary to explore theories on distance education as they provide us with a map or framework on everything that is already known about distance education. They describe and explain a phenomenon. Theory shows the relationships between parts of a phenomenon and it provides information on what needs to be researched in the sense that it highlights unknown fields for which no theory has been established yet. As this study is about when an employer is ready for distance education, it is crucial that this form of education be well understood so that it can be applied appropriately (Moore & Kearsley, 1996:211).

2.6.2 Peters' theory on distance education as the industrialisation of teaching

Based on two surveys done on distance education systems Peters stated in 1965 that the principles of industrial production should be applied to distance education. He did not believe like so many theorists of his time in a continuum between conventional education and distance education, which can be linked and interchanged. Distance education is different in that it is an impersonal, mechanical or electronic process. An artificially created message replaces educational communication (Keegan, 1992:78). This includes standardised procedures of planning and division of labour. Detailed planning involving various specialists is necessary before learning can take place. There are high levels of mechanisation to provide for the mass production of learning via printed material, audio, video and, nowadays, computer programming. Teaching activities are indirect and symbolic and there is alienation of subcomponents of teaching due to the division of labour. The view that distance education is the industrialisation of teaching is based on Peters' research in the early 1960s.

Peters further states that the growing industrialisation of societies will emphasise the growing need for lifelong learning. Society will never be able to provide enough educators to provide for this need, which makes the concept of distance education a revolutionary one. The development of the digital era brought about structural changes in the process of distance education. He sees distance education as "sui generis" – of its own kind and thus unique. The teaching-learning event is industrialised because of the replacement of oral communication by technology. Distance education differs from conventional teaching as conventional teaching is predominantly oral, whilst distance education is predominantly technical. There is a definite de-socialising element as face-to-face teaching can no longer be maintained (Moore & Kearsley, 1996:198–199; Peters, 1996:51–52; Mackintosh, Waghid & Van Niekerk, 1997:84–89, 114).

In summary, Peters (1989) clarifies that distance study is structurally different from conventional study because of the application of the following principles:

- There is *division of labour* because many people have to co-operate before learning can take place.
- Thorough *planning and organising* are required by various specialists, who have to plan, build and organise projects in order to compile a total package.

- *Mechanisation* is used for printed material, audio-cassettes, videos, computer technology, etc. as part of the distance education process.
- There is *objectivity* of teaching behaviour, since teaching becomes an object that can be manipulated according to the needs of the learner, i.e. adapted, modified, improved, etc.. It changes its subjective character as in a classroom and becomes objectified.
- *Scientific control* is obtained through evaluating the efficiency of the teaching in the field by experts.
- *Alienation* occurs because due to the labour division and the distance, both educators and learners easily become alienated, feeling isolated and frustrated (Peters, 1989:6–7).

2.6.3 Wedemeyer's theory on learner independence and autonomy in relation to distance education

Wedemeyer created the theory of the independent learner in 1971. He saw distance education learners as independent in controlling and directing their own learning.

Keegan describes Wedemeyer as the father of American distance education (Keegan, 1992:77). His thought on distance education is based on two beliefs namely a democratic social ideal and a liberal education philosophy. His democratic social ideal is based on his belief that no one should be excluded from an opportunity to learn merely because he is poor, unhealthy, geographically isolated, institutionalised, or socially or in other way disadvantaged.

The second aspect of liberal education philosophy is demonstrated by his belief that learning must be centred in the individual and that an adult has the right to learn. He based this belief on learner autonomy on the liberal education philosophies of North American theorists, Carl Rogers, Sameul B. Gould, Cyril O Houle and Allen Tough (Keegan, 1992:77).

To remove barriers of time and space in working towards the actualisation of this right, he realised that there should be a separation between learning and teaching. This produced the concept of independent study, where the learner and the educator go about their tasks separate from each other, with various means of communication in

between. This also implies the concept of learner autonomy in decision-making, which is obtained through geographic independence.

This separation of the planning of teaching and learning activities characterises **independent** distance education by separation of the learner and the educator. The learning and teaching processes are executed through the written or other mediums. The teaching done is **individualised**. All the learning activities lead to learning and convenience is established through being able to study in a familiar environment. Ownership is created through a personal choice of when to start and when to discontinue studying, and of the pace at which studying should take place.

Wedemeyer proposes three dimensions of learner autonomy in distance education, namely learning programmes that provide for self-pacing, individualisation where learners are allowed to follow their own course of study and freedom of choice in the selection of goals and activities, as well as the evaluation of the achievement of the goals (Keegan, 1992:77)

According to Keegan (1992:78) the responsibility for the success of learner autonomy is that of the distance educator, who must monitor and motivate the distance learner on a daily basis.

This approach by Wedemeyer, as mentioned above, has been criticized by Garrison and Shale (1987) as too limiting, as it does not consider technological delivery of distance education. They see distance education as merely an extension of access to learning to those who might otherwise be excluded. Moore responds to this approach as being too vague as there is evidence of many learners who engage in distance education for other reasons than merely a lack of access (Moore, 1990a:11–12).

The demand for learner autonomy can be illustrated by the example of some universities who instituted a selection tool for enrolling learners. At the Western Governors University learners have to complete a multiple-choice questionnaire in which explanations for some responses are given (Western Governors University, 2005). Comments include warnings that if they are not very self-directed and conscientious, they will find the course less satisfactory than when they are. This implies that not all adults naturally possess the prerequisites needed for distance education (Neal, 1999:42).

2.6.4 Moore's theory of Transactional Distance

Moore was interested in Wedemeyer's theory as he started to realise that distance can actually be beneficial for the learner. He studied many courses and in 1972 came up with a theory that sought to create a system by which one can classify distance learning courses and programmes. The theory of transactional distance was born as a combination of Peter's industrial production theory and Wedemeyers independent learning theory (Keegan, 1992:76; Moore & Kearsley 1996:198–199; Mackintosh, Waghid & Van Niekerk, 1997:84–89, 114).

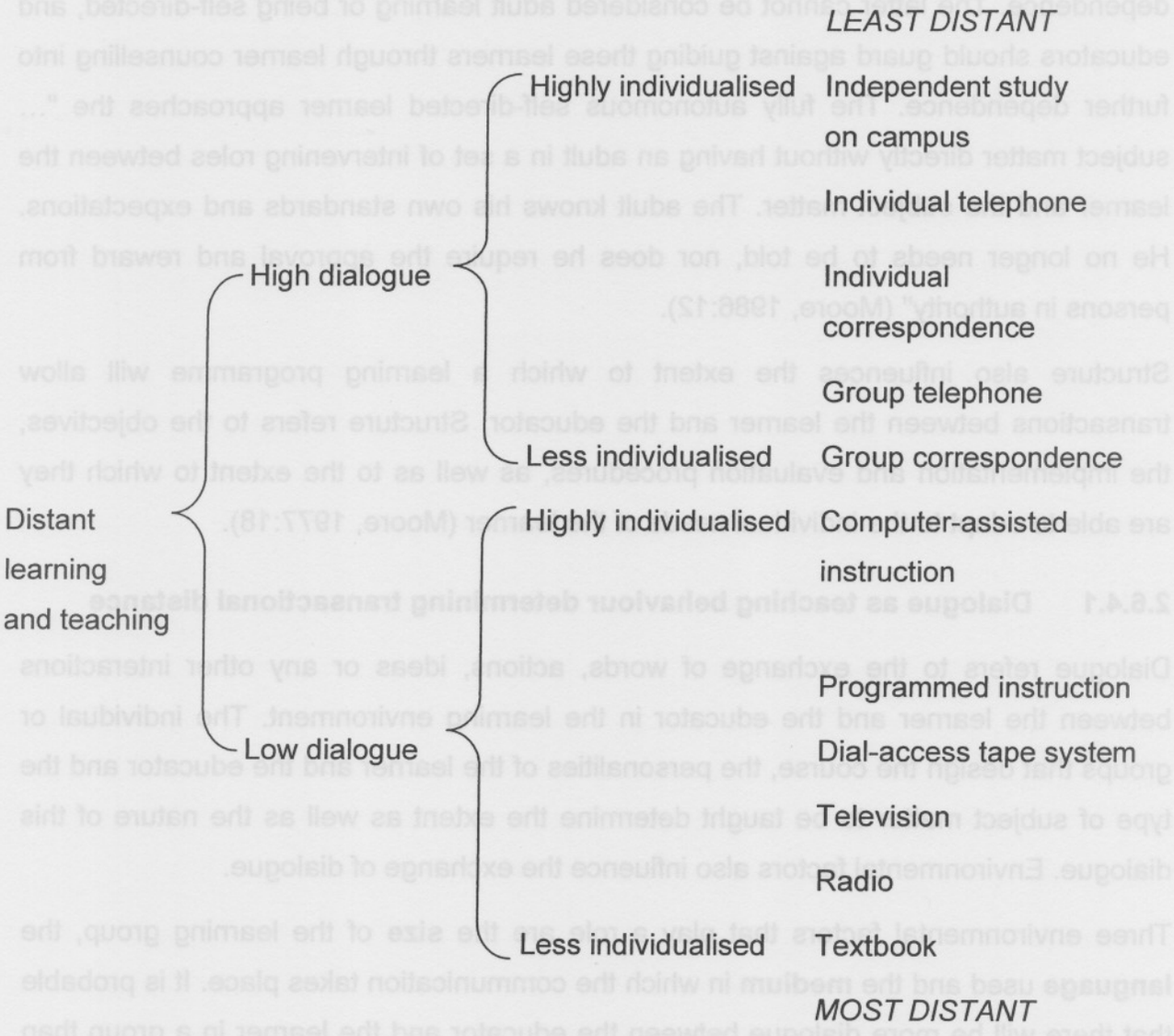
Moore (1973) defines learner autonomy as "The will and ability to exercise powers of learning, to overcome obstacles oneself, to try to do difficult learning tasks, and resist coercions". He classified distance learning and teaching methods by the dimensions of distance as demonstrated by Figure 2.2.

This theory postulated by Moore states that the distance in distance education is not a geographical phenomenon but a pedagogical one. The distance refers to a distance in understanding and perceptions caused by the physical distance between the learner and the educator that has to be overcome by careful design and planning of the educational programme.

The interplay of the learner and the educator in this distance makes up the transactions, which have special characteristics in that they portray special learner and educator behaviours as a consequence of the separation created by the distance. This separation causes the educator to present the content, interact and perform teaching duties that are different from classroom education. There can be no transactional distance or educational transactions if there are no learners, educators and communication channels.

The teaching behaviours can be divided into two main clusters, namely dialogue and structure. The amount of investment in each of these clusters when designing a course will determine how much transactional distance will be tolerated by either the educator or the learner. It can be postulated that learning programmes with a high degree of dialogue are less distant than programmes with a lesser degree of dialogue (Moore & Kearsley, 1996:200–201; Moore, 1977:18; Saba, 1999a:29).

Figure 2.2 Classification of distant learning and teaching methods in relation to distance (Moore, 1973:674)



Moore (1972) also introduces the element of learner autonomy (self-directedness) as a second dimension of distance teaching. Independent learning and teaching are considered the first dimension of distance teaching. He describes learner autonomy to be the extent to which the learner controls and influences his learning. The key characteristics of his theory of independent learning and teaching are autonomy, individualisation and dialogue (Moore, 1972:80).

According to Moore (1986:12) the adult learner is usually self-directed, and institutions offering distance education have three kinds of adult learners. The first kind is the self-directed learner who decides to follow the programme because it meets his learning goals. The second type is the learner who engages in the course because he is in need

of a degree or some or other formal accreditation. The third learner has no need for certification or satisfaction of a personal goal but does it to satisfy an emotional need of dependence. The latter cannot be considered adult learning or being self-directed, and educators should guard against guiding these learners through learner counselling into further dependence. The fully autonomous self-directed learner approaches the "... subject matter directly without having an adult in a set of intervening roles between the learner and the subject matter. The adult knows his own standards and expectations. He no longer needs to be told, nor does he require the approval and reward from persons in authority" (Moore, 1986:12).

Structure also influences the extent to which a learning programme will allow transactions between the learner and the educator. Structure refers to the objectives, the implementation and evaluation procedures, as well as to the extent to which they are able to adapt to the individual needs of the learner (Moore, 1977:18).

2.6.4.1 Dialogue as teaching behaviour determining transactional distance

Dialogue refers to the exchange of words, actions, ideas or any other interactions between the learner and the educator in the learning environment. The individual or groups that design the course, the personalities of the learner and the educator and the type of subject matter to be taught determine the extent as well as the nature of this dialogue. Environmental factors also influence the exchange of dialogue.

Three environmental factors that play a role are the **size** of the learning group, the **language** used and the **medium** in which the communication takes place. It is probable that there will be more dialogue between the educator and the learner in a group than between any learners in a group of learners (Moore & Kearsley, 1996; 201). So it is also known that learners working in a foreign language interact less. An important environmental variable is the medium in which communication takes place. If writing is used, communication tends to be slow and highly structured. Dialogue can be much faster and more frequent if computer conferences are used as communication medium (Moore & Kearsley, 1996; 201–202).

Audio-conferencing through use of the telephone, because it is group-based, elicits less dialogue per individual learner. Asynchronous methods like text-based computer conferences create more dialogue, especially among foreign language speaking learners. When video-telematic courses are used, there is no dialogue between the

learner and the educator. The dialogue in the latter case exists only within the learner and is called "internal didactic conversation".

Table 2.1 The relationship between transactional distance, dialogue and structure (Mackintosh, Waghid & Van Niekerk, 1997:104; Keegan, 1992:80).

	Level of dialogue and structure	Explanation
Distance is at its highest level	Low levels of dialogue Low levels of structure	No dialogue, no structure, i.e. independent reading study programmes.
	Low dialogue Structure present	No dialogue but with structure, i.e. radio or television teaching.
Distance at its lowest level	High dialogue High structure	High dialogue and also highly structured, i.e. correspondence courses.
	High dialogue Low structure	Programmes with high dialogue but low on structure, i.e. a learning package using tutorial like dialogue. Interaction takes place through e-mail.

The importance of dialogue is emphasised by Holmberg and Saba – (quoted by Moore & Kearsley,1988:202, 208–209) – who explain that dialogue is the critical defining aspect of distance education. Saba highlights the inverse relationship between dialogue and structure (Table 2.1). If dialogue increases, structure decreases, and visa versa (Moore & Kearsley, 1996; 201–202).

2.6.4.2 Structure as teaching behaviour determining transactional distance

The course designed for delivery at a distance has specific elements or structure consisting of learning objectives, themes of content, modules, presentations, evaluation processes, etc. The structure of the course is determined by the philosophy of the group or individual presenters of the course, the academic level of the learner, and the nature of the content itself, as well as especially by the communication media used to present the course (Moore & Kearsley, 1996:202).

Learners vary according to their learning styles and degree of independence and would need different levels of structure in the design of distance education. The structure of the course determines the rigidity or flexibility of the course and thus the extent to which it accommodates the individual needs of the learner. Text designs that are highly structured are self-contained and demand specific actions to happen (use of material and in-text exercises) before a specific cut-off time. Low-structured designs are more flexible, providing lists of resources from which learners can choose and read in their own time, or they are allowed to find material themselves. Highly structured designs can foster dependence on the package itself, whereas low-structured designs foster independence through unsupervised self-study. So is the presenting of a course through television is highly structured and provides no opportunity for the learner to deviate from the prescribed sequence of events, whilst teleconference courses can be structured in such a way that it is possible for the learner to follow more than one prescribed path through the content (Moore & Kearsley, 1996:203; Ros, 1998:611; Hartley, 1998:13).

2.6.4.3 Dialogue and structure determine the extent of transactional distance

The use of dialogue and structure in a course serves as a measure of transactional distance. The transactional distance in the use of video-recording as communication medium is high, since it is very structured and the possibility of dialogue is low. In the use of teleconferencing as an educational medium the transactional distance is low

since it is not so structured and provides more opportunity for dialogue. Where the transactional distance is little, the learners rely on the course instructor for guidance through dialogue, and course material is arranged according to individual needs. If transactional distance is high, the learner has to rely on himself for guidance and make his own decisions on what, how and when to study (Moore & Kearsley, 1996:202–204; Moore, 1977:18).

In a study done by Chen and Willits (1998) on determinants of perceived learning outcomes and transactional distance, they found that two variables had a significant effect on the level of perceived learning outcomes, namely the frequency of in-class discussions and the circumstances that contribute to greater in-class discussions. The circumstances that contributed to in-class discussions were the physical presence of the instructor, smaller learning groups and the learner's prior knowledge of the subject. Frequency had a direct, positive effect on the perceived learning outcome and provided an indirect effect by decreasing the transactional distance. The circumstances contributing to greater in-class discussions had a positive indirect effect on the perceived learning outcomes (Chen & Willits, 1998:52 & 61).

The extent of the transactional distance also prescribes the amount of learner autonomy that is expected from the learner. The greater the transactional distance the more learner autonomy is needed. The ability to determine a learning programme, find resources and meet learning objectives independently does not exist equally with all learners. Learner autonomy is often used to define, describe and classify learning programmes as it indicates to what extent the learner is expected to function on his own (Moore & Kearsley, 1996:205).

The success of any distance education programme depends on the ability of the designers of the course to understand the instructional problem and create the best possible transactional distance to address the problem. Not all courses require a small transactional distance. Some courses particularly may demand a large degree of learner autonomy and must provide an environment that enhances this attitude (Moore & Kearsley, 1996:205).

Moore (1977:30) proposes that the amount of learner autonomy can be tested in the preparation, execution and evaluation phase of a course by asking three questions: Is the selection of learning objectives that of the learner or that of the educator? Is the selection of resources, pace of work and learning experiences that of the learner or the

educator? In the evaluation process, who decides on the selection of criteria and method to be used for evaluation, the learner or the educator?

Moore (1986:11) suggests that the concepts of dialogue and structure should be used to analyse and organise distance education. Where there is dialogue but no structure the educator can consider the learner's intellectual abilities, emotional needs, prior experience and cognitive styles to personalise his own learning programme, causing it to be less distant. When dialogue is absent and there is a high degree of structure the learner cannot negotiate his learning programme, but he can decide in what sequence to do the programme, when to learn and what to learn. This programme is more distant and requires more learner independence. The adult learner has a choice whether or not to follow such a programme.

In situations where the adult has complete control over what he wishes to learn and how he wishes to learn it and also has control over the method of assessment, pacing and sequence of the programme, it is possible but only outside the formal education system. Modules from various learning institutions can be chosen irrespective of the institution or the method in which it is being presented. This type of learning is self-directed and completely autonomous. The Empire State College, which forms part of the New York State University, follows such a programme (Mackintosh, Waghid & Van Niekerk, 1997:105–106; Keegan, 1992:80–81)

The results of Chen and Willits' (1998) research project on video-conferencing, stress the need for educators to understand the multidimensionality of dialogue, structure and autonomy in order to sensitise them to the complexities of these elements and encourage them to use the varying types of dialogue, to consider the degrees of flexibility to be built into a course and to foster independence as well as inter-dependence of all learners (Chen & Willits, 1998:55–58; Chen & Willits, 1999:57).

Considering the diversity amongst adult employees in a workplace it is important to design or plan for flexibility in the structure of e-learning so as to meet the various levels of learner autonomy, namely more structure where there is less autonomy needed and less structure where more autonomous behaviour is required.

2.7 INTERACTION AND COMMUNICATION IN DISTANCE EDUCATION

2.7.1 Types of interaction and distance education

The assumption is often made that the separation between the learner and the educator can easily be overcome by merely importing technology to set up good communication to make up for the loss of contact between the learner and the educator. Moore (1993a:1) expresses the criticism that this is immature and that these educators do not understand the types of learning interaction needed in distance education.

Moore (1993a) sorts interaction in distance education into three categories, namely learner-content interaction, learner-instructor interaction and learner-learner interaction.

Learner-content interaction includes the exposure of the learner to the subject knowledge and is seen as the defining characteristic of education. Intellectual interaction with content influences changes in perspectives, cognitive structure and understanding. This type of interaction include intra-subject interaction (which refers to the internal cognitive processes, or the thinking processes, that take place within the learner (self-talk)).

Learner-instructor interaction refers to the interaction between the learner and the subject matter expert and tutor. The communication can take various forms, from direct dialogue to written feedback on assignments.

Learner-learner interaction involves the interaction between learners with or without the presence of the instructor (Mackintosh, Waghid & Van Niekerk, 1997:110).

2.7.2 Saba's analysis of interaction in distance education using telecommunications.

Saba (1988:17–24) did research on the dynamic interaction between dialogue and structure during the use of interactive telecommunication.

He concluded that dialogue can be increased through the use of telephone conversation as well as two-way video and interactive telecomputing. Virtual face-to-face communication through the use of technology drastically improves dialogue and reduces structure, yet infringes on the learners' right to learn when he/she wants. It can

reduce the geographical separation but is still bound to time. The ideal would be to optimise dialogue such that it does not infringe on the independence and autonomy of the learner.

Saba (1988:22–23) finds that dialogue serves as a balancing factor between structure and learner autonomy. If dialogue increases structure, learner autonomy is reduced. Indirectly dialogue can support autonomy. The learner communicates his needs, which leads to an adaptation in goal setting, use of instructional material and evaluation procedures. The latter once again contributes to the learner's own specific needs in order to reach a state of independence. The amount and quality of transactions between the learner and the educator in distance education is of the utmost importance, if distance is to be considered a function of the responsiveness of an educational programme. A proper balance between dialogue and structure will create the ideal instructional strategy (Mackintosh, Waghid & Van Niekerk. 1997:110–112)

Saba (1988:21) states that integrated telecommunications create virtual contiguity through sight and sound and sharing of printed documents. This minimises the transactional distance, as can be noted in the following statement: "Virtual contiguity is a paradox in distance education: it brings educator and learner together, it optimises dialogue between them, and it eliminates consequences of being separate in space" (Saba, 1988:21).

2.7.3 Holmberg's theory on guided didactic conversation as communication models in distance education

According to Keegan (1992:76) Holmberg is the father of this theory, which is based on his belief that distance education is a separate mode of education in its own right. The uniqueness of distance education stems from the one-on-one contact that exists between tutor and learner. This personal communication is the source of his humanistic approach of guided didactic conversation .

Mackintosh, Waghid & Van Niekerk (1997:115–116) states that Holmberg's humanistic view of education is characterised by individual learning as being the most important aspect of education, as examination periods and pacing of learning must be a free choice made by the learner. Freedom of choice should also be applied to choosing content and study processes. There must be ample provision for two-way communication and feedback processes; administration, counselling, teaching and

evaluation should support individual learning; distance education is self-study, not private reading. The latter is verified by the fact that distance education involves two-way communication and intentional teaching.

They (Mackintosh, Waghid & Van Niekerk, 1997:116) also state that Holmberg sees distance education as deep learning and as an individual activity. Learning is guided and supported by non-contiguous means. Feelings of empathy and belonging support the learning process and can be elicited without direct face-to-face contact through allowing the learner to be engaged in decision-making by using conversation like presentations anchored in existing knowledge, by friendly non-contiguous interaction between learner and educator and the liberal use of organisational-administrative support structures.

Holmberg further divides guided didactic conversation into two types, real communication and simulated communication. Real communication between the learner and the educator consist of using telephone, face-to-face conversation, e-mail, interactive video and computer-mediated conferencing. Simulated communication refers to the educator's choice of conversational style in the use of educational material as well as the internal conversation that takes place in the learner's head (Mackintosh, Waghid & Van Niekerk, 1997:116).

Holmberg emphasises the need for dialogue and personal relationships as a requirement for education. The communication can manifest itself as guided didactic conversation. He based this view on the hypothesis that learning can take place in an organised fashion without the need for the educator to be present. A crucial element for learning is the intrinsic motivation of the learner. If assimilation of subject matter takes place into the learner's existing cognitive framework, learning is promoted. Emotional involvement also promotes learning through stimulating deep learning and goal attainment, and this emotional involvement can be attained through warm human relationships. Learning motivation and study pleasure are promoted by feelings of rapport with teaching staff. Intellectual pleasure promotes deep learning and goal attainment. He further hypothesises that allowing the learner to participate in goal-setting and planning study activities leads to commitment to and ownership of his learning, and the attainment of learning goals. Frequent helpful communication with people sharing the same interest in this field facilitates the learning process. Mature learners are more

independent and internally motivated and master difficulties much easier (Mackintosh, Waghid & Van Niekerk, 1997:114–118; Keegan, 1992:76–86).

From the above theories on communication it is clear that enabling dialogue during e-learning is a vital component to plan for when embarking on the event. The absence of dialogue hinders optimal learning as the benefits, namely communication with others learners and the educator as well as emotional support, are not possible. The only dialogue would be between the learner and the content, which again demands a tremendous amount of learner autonomy, which not all of them have.

2.8 THEORETICAL REFINEMENT OF THE CONCEPT DISTANCE EDUCATION

During the 1980s various experts further described the basic concepts of distance education.

Keegan (1980:13–16), after examining the definitions of distance education by Holmberg, Moore and Peters, concluded that distance education is characterised by six elements, namely the separation of educator and learner, differentiation from private study, two-way communication, the use of media to carry content, the use of an industrialised process and occasional meetings (see paragraph 2.3 of this chapter).

Added to these six elements, Garrison and Bayton (in Moore & Kearsley 1996:207) further enlightened the concept of learner autonomy. They explained that all courses have some degree of learner autonomy or control. Control or autonomy is established by a balance created and maintained between pacing, the negotiation of objectives and the use of dialogue. The greater the pacing in a course and the higher the structure, the lower the learner autonomy and the greater the educator control.

Saba (1988:22–23) (see paragraph 2.7.2) developed a systems dynamic modeling technique that demonstrates and explains the interaction of various forces in distance education. He demonstrated a relationship between an increase in structure and a consequent decrease in dialogue, and visa versa.

Kember's Open Learning Model as quoted in Moore and Kearsley (1996:210) describes the factors that influence adult learners towards the completion or non-completion of their studies. It describes the extent to which the adult is capable of integrating his study with his everyday employment, family and social life. He suggests that learner progress

can be improved if courses are designed to develop intrinsic motivation, collective affiliation and congruence between learner expectations and course procedures.

2.8.1 The characteristics of distance education

Based on prior discussion of the various theories on distance education, Holmberg (in Mackintosh, Waghid & Van Niekerk, 1 997:118) identified specific characteristics of distance education that should be adhered to in order to ensure success. From a pedagogical point of view, goals must be clearly presented, allowing the learner to see the relevance and make a selection where possible. Courses must be structured on the basis of the prior learning of the learner so as to enhance assimilation and internalisation of new knowledge in existing cognitive structures. There must be invitations to exchange views, to judge and to question what is to be accepted and what is to be rejected. Personal interest in the subject must be promoted through emotional involvement of the learner. Constant open communication facilities are to be used for questions and the viewing of opinions. Assignments designed to teach the learner how to solve problems must be included. This should be combined with helpful and extensive feedback from tutors. Self-assessment is to be done where skills are to be practised. The marking of assignments should be quick. Learners should not have to wait too long for feedback.

The easy readability of course material is an important layout principle to adhere to when presenting courses in distance education. They must be written in a conversational style with clearly accessible study material where the information is of medium density. Definite clear advice to learners with regard to what they should do and avoid doing and what specifically should receive attention, with reasons for the latter is to be included. A personal style using possessives pronouns (mine or your) must be used to create an atmosphere simulating close contact. Themes must be clearly demarcated by typographical means, explicit statements or the changing of presenters or speakers. The educational material must be easily accessible. This can be done through the effective use of graphic and typographic features (Mackintosh, Waghid & Van Niekerk, 1997:118–119).

Many institutions think that merely recreating the classroom with technology at a distance represents distance education. This is a very immature approach. "Mature distance education does not consist of adding new technology to old ways of organising

teaching and learning. It consists of organizing or reorganizing educational resources into a total delivery system" (Moore, 1993a:1–2). For successful delivery of distance education it is important that the tutors understand the characteristics of distance education and know how to use the delivery system for tutoring. Failing to prepare the tutor for such a system can lead to negative effects, as experienced by the Open University of Tanzania. This university attempted distance education without properly preparing all the lecturers. This led to various complaints on delayed feedback, bad quality of correspondence, bad record-keeping, not enough effective guidance and counselling, and problems with having enough tutors to attend distant contact sessions. All of these complaints are indicative of a lack of understanding of the characteristics of distance education (Bahalalusesa, 1999:18–21).

Ragan (1999:21) offers a set of guiding principles to be followed when a learning institution attempts to implement a quality distance education experience. These principles are the product of the faculty of Penn State, Lincoln and Cheyney University. He discusses his principles as resorting under two components that are inherent to distance education, namely the educational component and the enabling component. The educational component is broken down into and discussed in three categories. He firstly deals with how to address learning goals and how to present content, then he looks at interaction with learners, and lastly he describes how assessment should be planned. A fourth category, namely the use of media and tools, and a fifth, learner support systems, are grouped and discussed under the enabling component of distance education.

- **The educational component and its three categories:**

  Category One: Learning goals and content presentation

  The identification of learning goals is fundamental to any educational event. It should be well communicated and forms the basis for the learning contract to be closed between the learner and the tutor. The goals need not change from traditional to distance education delivery systems, but certain design strategies have to be utilised in order to ensure that outcomes are reached, as stipulated by the learning goals.

  Principles to be considered are learning goals that should form part of the educational design plan. They should be clearly and explicitly communicated to the learner in any choice of delivery of distance education, whether it is face-to-

face, in print or on the web. Instructional activities and course sequencing should direct and provide the learner with the skills to achieve the goals. Assessment should be directed at evaluating whether the outcomes as stipulated by the goals have been achieved. A wide range of services should be available to instructors for instructional designs and support in the creation of instructional materials (Ragan, 1999:21–22).

Category Two: Interaction

Learner interaction with other learners, the educator and new material elicits a process of interpretation and making sense of the new material. It creates a collaborative community of learners which motivates and enhances the learning process. Specific design strategies to incorporate opportunities for interaction should be built into the instructional programme.

The principles to be considered here are that effective learning environments are enhanced by frequent meaningful interaction amongst learners, between the learner and the tutor, as well as between the learner and the material. If technology is to be used, one should also consider the interface between the learner and such technology. Social interaction should be encouraged throughout the instructional design of the educational programme. Electronic communication technology should be considered as a device for maintaining interaction. Creative solutions should be employed to address traditionally achieved objectives, such as interaction that reaches beyond direct instruction, access to advisory and academic support, as well as socialisation in the field of study. Barriers to establishing social relationships should be broken down by affording learners the opportunity to familiarise themselves with the distance education paradigm and the use of technology (Ragan, 1999:22).

Category three: Assessment and measurement

Creativity in assessment design assists both the learner and the instructor in establishing progress. Assessment instruments should be congruent with the learning goals as well as with the skills required of the learners. Assessment should be integral to the learning experience as it provides learners with a view of their progress, and it helps them identify shortcomings and re-establish immediate lesson goals. It should accommodate the special needs, characteristics and situations of the distance learner. Ample opportunities should be built into the

programme for the learner to access and receive feedback on their learning activities (Ragan, 1999:22).

- **The enabling components of the guiding principles for distance education**

Category Four: Instructional media and tools

Instructional media overcome barriers of remoteness and time in distance education. Ragan (1999:22) discusses various principles in regard to the use of media and tools. The technology chosen should support the learning goals. The technology should be accessible to the learner and should cover the widest range of use possible for the selected target group of learners. It should add value and should not be chosen for the sake of cost or for any other reason. The instructional design should predict which technological approach to use. Users of the technology should be adequately prepared in order to maximise the capability of the media chosen. Programme design should consider the diversity of learners. Various backgrounds and learning styles will affect how learners think and how they use the available technology. Lastly, contingency plans should be in place, should the chosen technology fail at a specific point in time (Ragan, 1999:23).

Category five: Learner support systems and services

These services should reflect the same efficiency in distance education than on-campus learning environments. Principles to be adhered to are the existence of a comprehensive technology support system to address any problem the learner experiences related to technology. Faculty members should have adequate support in the areas of applied instructional technology as well as its use in distance education. These support services should be available from 7 to 24 hours per day, depending on the type and need for the service. Evaluative feedback systems should be implemented to test the efficiency of support services on a continuous basis. Instructional policies should stipulate the supportive measures to be used for learners and faculty in distance education (Ragan, 1999:22–23).

Besides the educators needing to understand distance education, the institution also needs to understand distance education as a system. Distance education as a system has many integrated and interacting parts. It should be thought of as a network of knowledge sources, managers, processors, communication media and learners. Various other organisations generate and add knowledge to the distance

education organisation, like schools, corporations, other universities, etc. It develops several instructional programmes and delivers them through various communications media. The whole system is well demonstrated by Moore (1993a:5) in Figure 2.3 below.

2.9 EVALUATING DISTANCE EDUCATION COURSES

2.9.1 The evaluation research of Rangecroft, Gilroy, Long and Tricker 1999.

Rangecroft, Gilroy, Long and Tricker (1999:17) did research in which they identified characteristics of a distance education delivery system that are important to the learners. This can be used as a template to evaluate the service delivery. The template was compiled by doing surveys amongst learners as well as tutors in order to grasp all the most applicable elements (see table 2.2).

Figure 2.3 A Holistic Distance Education System (Moore, 1993a:4–5).

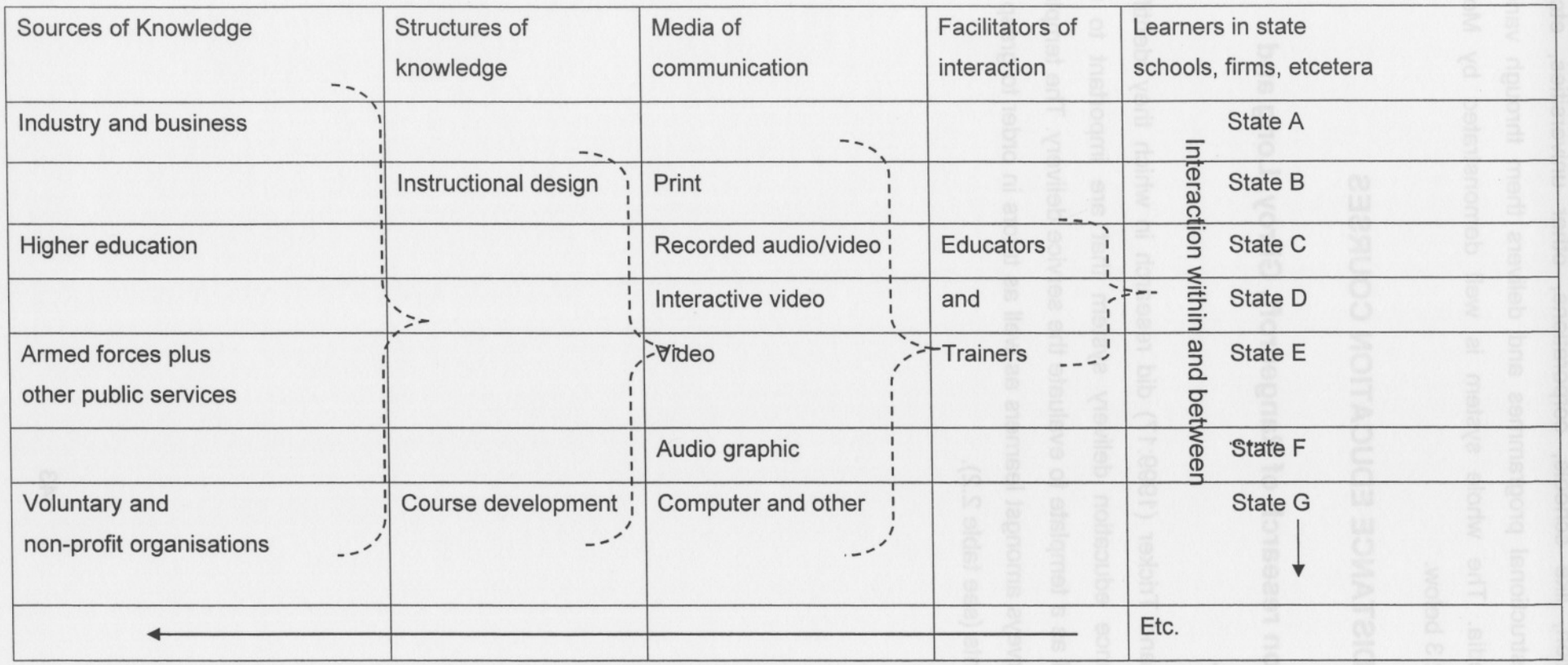


Table 2.2 Rangecroft, Gilroy, Long and Tricker's characteristics of distance education (1999:17)

	High Importance	Medium importance	Low importance
Decision to join a course	Professional development Course content Personal development	Widening of career opportunities Relevance Flexibility of study patterns Course reputation Extent of the required attendance Extent of academic support Extent of required study time Comprehensive information	Duration of the course The price The mode of assessment Response to the initial enquiry Success rate The type of media used Opportunity for contact with others Facilities offered by institution Regarding course satisfaction Contact with others in the field Ease of registration
Course satisfaction	Study flexibly	Access to tutors Professional development Broadening of experience Personal development	None mentioned

	High Importance	Medium importance	Low importance
Course satisfaction (continued)		Extent of tutorial support Ease of communication with the institution Relevance to your work Level of individual learner support Appropriate support services	
Course material	Quality of the content Logical structure and consistency of course material Readability Up-to-date content Clear learning outcomes Punctual delivery of material	Availability of text Quality of presentation Being self-contained Physical durability of material	Variety of media

	High Importance	Medium importance	Low importance
Contact sessions	The content	Opportunities for face-to-face contact with tutor Teaching methods How often you have attended during the year The face-to-face contact time Opportunities for contact with learners	Time of attendance required during the year Accommodation for teaching Residential accommodation Refreshments
Assessment	Quality of the feedback, Relevance of assignments Clarity of assessment criteria, Timely feedback Flexibility of submission dates	Dissertations Timing of assessment	None mentioned

(Rangecroft, Gilroy, Long and Tricker, 1999:20–21)

Factors considered to be low in importance were only mentioned under "Decision to join the course", namely influence of the employer and brochures.

The research executed seems to have succeeded in compiling a generic list for evaluating learner satisfaction with distance education. Open-ended questions were included but they were rarely filled in. The answers of the ones that were completed related more to performance than to importance. The results of this study can assist course planners in focusing on what is important and avoid spending money on non-essential issues (Rangecroft, Gilroy, Long, & Tricker, 1999:18–23).

2.10 DISTANCE EDUCATION AS A STRATEGY SERVING MANY EDUCATIONAL OBJECTIVES

Smith (1998; 63–72) describes distance education as a strategy that can be used for many objectives. The paragraphs which follow describe his views.

Clarity with regard to business goals and educational objectives are the key to the effective use of distance education as a strategy for course delivery. If distance education in itself is the goal, it often fails. Careful goal-setting is needed to align itself with the business objectives or the educational institution's objectives in order for distance education to be successful.

Generally business and educational institutions share five goals, and they often use distance education as a strategy to achieve these goals. They are access, reach, quality, efficiency and customer service.

Access as goal needs to be further clarified by asking: Access to whom, and under what circumstances? It normally refers to the use of distance education in reaching globally dispersed and isolated learning communities. However, it may not be cost-effective if these communities are very small. Access can also mean admitting those learners who are otherwise unable to attend the institution for social reasons. For business communities, access means providing training during working hours instead of sending a selected group to a workshop.

Reach is a common goal amongst learning institutions as it expands their pool for recruitment of potential learners. It can also solve problems with regard to specialised courses where a certain number is needed before the course can be presented. When reach is considered to be the goal, clear objectives with regard to the nature and size of

the potential audience should be established. The marketing and promotion activities will be related to these objectives.

When quality is the goal, distance education often uses technology to improve the quality of courses offered. It provides for increased contact among specialists in a particular field, thus enhancing benchmarking and networking to maintain standards of training. It improves contact and communication of the learner, which in turn enhance the learning process. For businesses, quality is added by consistency of delivery of the material to be learned.

Efficiency as a goal is served by distance education as a strategy by more efficiently applying resource and learner times in education. This is an important requirement in all organisations that are aware of the constant demands on the time of their employees. Cost-effectiveness interpreted as a reduction in costs is seldom a feasible goal for distance education delivery as the cost-effectiveness is actually obtained indirectly through improving quality and efficiency of education.

Lastly, customer satisfaction can be as much a goal for an educational institution as it is for a business. Learner satisfaction is very much a need to be addressed in distance education. Content of courses should be specifically targeted at the needs of the learner. The latter is especially applicable to businesses that need their employees to be competent in order to maintain a healthy business. The use of technology as a tool for the delivery of distance education greatly improves customer satisfaction as it is very convenient in providing learning opportunities around the clock at times that suit learners.

Clarity in goal definition will enhance the enlisting of teaching staff, learners, alumni and supporters as they can clearly see whether the goals match their needs for education (Smith, 1998:63–72).

2.11 CONCLUSION

Integrated in the planning for success of a learning event, the educator needs to know what criteria should be adhered to in order to ensure a successful distance delivery learning experience. Mere efficient use of technology is not enough.

The characteristics and nature of distance education were clearly established in this chapter. Educators should consider integrating this as well as the criteria for the successful use of technology into their learning programmes. To summarise, the

educator needs to acknowledge the characteristics of distance education as education that is different from face-to-face education in that there is separation of the educator and the learner. This creates transactional distance, which complicates the learning process. Communication and didactical techniques must be applied with the intent of overcoming this distance. Distance education is not private study as it needs coaching and facilitation from a central point by an organisation, whether it is an educational institution or the workplace training centre. It is characterised by the use of media to carry educational content and a highly industrialised process to ensure smooth operation in the managing of larger than classroom-size learning groups.

Planning of learning programmes should be such that learners can strike a balance between the course structure and communication so as to achieve their own desired levels of learner autonomy (Keegan, 1980:33).

Just as with technology, the goals for using distance education as delivery system should be clearly defined. Choosing technology as goal just because it is available and choosing distance education as a goal in itself will lead to failure. It is important to understand that both are in themselves tools or systems for delivery and can therefore not ensure educational success. They are vehicles that carry the real goals of distance education, namely reaching all learners, ensuring easy access to and improved quality of courses, more efficient use of resources and learner time, and maintaining learner satisfaction (Smith, 1998:63–72).

The educator must use these vehicles to plan for an effective learning event. Knowledge of these vehicles is not enough. Understanding how learning takes place and how various learning theories can be used as passengers of the vehicles will be discussed in the following chapter. To illustrate and assist in the understanding of the concept of distance education and technology as vehicles for learning the following picture (Figure 2.6) can be used to highlight the intended meaning.

The researcher has not explored everything represented in this picture. The changed roll of the learner and the educator needs to be discussed, as well as the role that the educational organisation plays. The tools used to cross the distance in the delivery of education, namely distance education and technology, will still be explored. In the next chapter the researcher will explore the content of the vehicle of delivery, namely the use of learning theory in the representation of the content material.

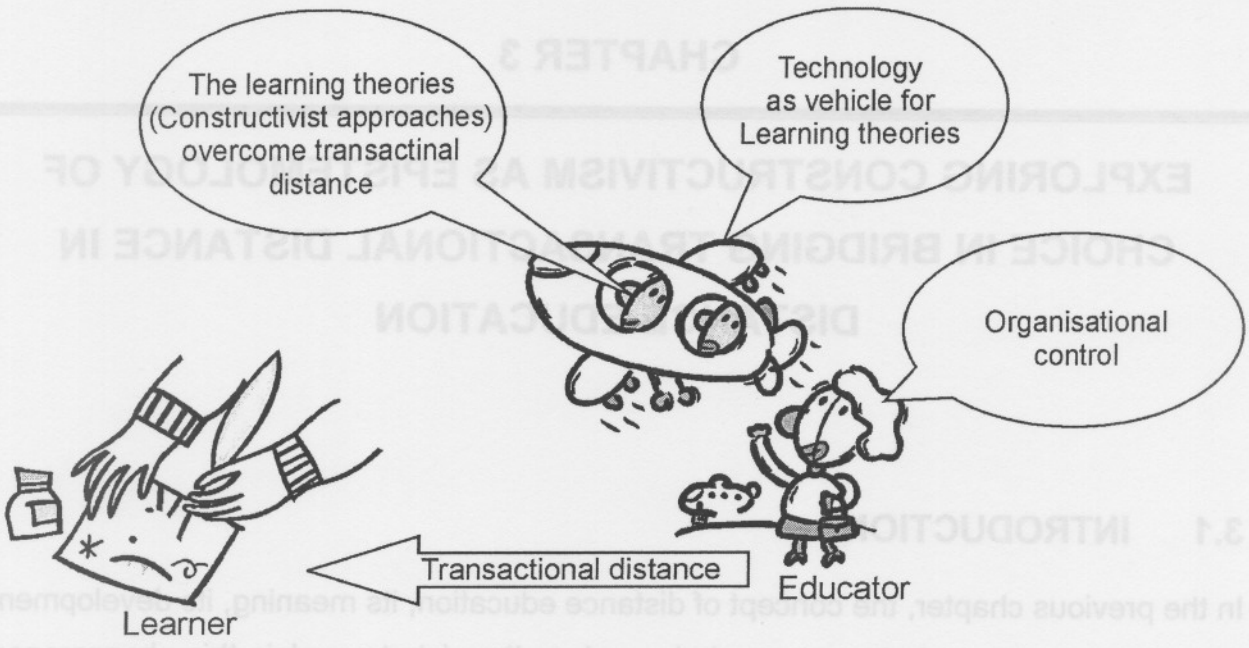


Figure 2.6 Technology with constructivistically designed courses to overcome transactional distance

Particular attention will be given to the constructivist epistemology because it creates the right environment in which the transactional distance of distance education can be erased. If applied correctly, it reintegrates teaching at a distance by making up for the losses of direct-contact teaching (Keegan, 1992:83–84). It enhances learner independence by enhancing the learning process through promoting collaboration. It removes the need to overcome the transactional distance in distance education, because it links with Wedemeyer's theory of learner autonomy. Where the latter is low, constructivist design of material will make up for the lack thereof. The constructivists design will assist the learner to overcome the need for teaching and cause a shift towards learning. Where the transactional distance is large, it reduces the need for a highly structured approach by forcing participative learning, thus overcoming transactional distance.

CHAPTER 3

EXPLORING CONSTRUCTIVISM AS EPISTEMOLOGY OF CHOICE IN BRIDGING TRANSACTIONAL DISTANCE IN DISTANCE EDUCATION

3.1 INTRODUCTION

In the previous chapter, the concept of distance education, its meaning, its development over the centuries and attempts made by various theorists to explain this phenomenon were discussed. This brought one to an understanding of the unique characteristics of distance education and the measures that need to be taken to ensure a positive distance education learning event.

In this chapter, we will explore the nature of knowledge (epistemology), as well as how an adult learns (theory) in relation to the Information Age. Also discussed is how this epistemology must be used to bridge the transactional distance gap, which is inherent to distance education (Hein, 1991).

Two basic epistemologies, Objectivism and Constructivism, are discussed and reasons are given why Constructivism is the choice of epistemology for distance education. The confusion of many theories and different categorisations of theories will be simplified so as to make them more user-friendly for educationists.

Constructivism as choice of epistemology for this study is highlighted by a description of its unique characteristics. Attention is given to the Constructivist pedagogical models, strategies and technologies that can be used in support of a Constructivist approach.

3.2 LEARNING IN THE INFORMATION AGE

Key markers (see table 3.1) distinguishing the Industrial Age from the Information Age serve as helpful criteria in evaluating whether education and training are stuck in the Industrial Age or whether it has adapted to the demands of the Information Age. Reigeluth (1996:14) is of the opinion that most education and training are still aligned with the industrial age rather than the requirements set forth by the Information Age.

Needs of the information age that are not being addressed by education and training are customisation, diversity and initiative. By teaching large groups the same content in the same amount of time teaching is not only standardised but learners are also sorted by comparing them with each other. This allows for distinguishing the managers from the common labourers, as was needed in die industrial era. The information age requires learner-centred non-standardised but customised training. Yet most training remains unchanged, and merely changing the content will not make it learner-centred. The current training paradigm supports conformity and compliance. Learners are expected to comply with and conform to the direction of the trainer. However, the modern-day employer needs an employee who is innovative and brings diverse thinking to the workplace (Reigeluth, 1996:14).

In a technologically fast-developing post-industrial global arena, it is expected of the learner – in order to keep track and control the knowledge explosion – to be technologically skilled, have a global vision, as well as have skills to continuously seek and apply new information and perform cognitive tasks in ill-structured domains. Mastering new knowledge and skills has become a continuous process effecting lifelong learning. Due to the ever-increasing amount of easily accessible knowledge available, fully mastering a topic has become a non-attainable learning goal. The movement away from the industrial age towards the information age brought a shift away from teacher-centred to learner-centred training. Duchastel (2003a) states that the values of society have changed from "..more mundane elements of knowledge and compliant attitudes to higher forms of problem solving and initiative."

Due to this change, open learning and Constructivist environments became a natural choice for education as it complies with the changed need of society to develop learner initiative, teamwork, thinking skills and diversity. Training and education need to focus less on instruction and more on construction of knowledge. This requires a multi-perspective approach and flexibility in the perceptions of and the context in which learning takes place. Emphasis is placed rather on the critical evaluation of the way in which knowledge is constructed rather that the content of the knowledge itself (Wilson *et al.*, 1995). There is a move away from passive decontextualised learning to active learning and, most importantly, the shift away from time-controlled training to allowing the learner the time needed to reach the desired outcomes. To comply with this, the educator cannot teach the same content to the same people in the same amount of

time, but has to become a guide focused on learner-centred training (Reigeluth, 1996:14 and 19).

Where educational technology in the 1950s originally focused on individual instruction with a behaviourist stimulus-response approach, the situation changed in the 1980s with more powerful technology, and for the first time questions were raised over the pedagogical loss of control as technology was approached as a way to automate instruction. The possibility to introduce and implement philosophies of cognitive psychology has been noted by some, and there was a move away from a behaviourist approach to focus on the internal mental processes when learning and on learner-centeredness. In the 1990s, the age of networks, namely the worldwide web, local area networks, etc., geographical distance became blurred and the concept of "transactional distance" became easier to overcome. Due to the opportunity, a global perspective of learning also developed and pedagogical models like flexible learning, learning communities and knowledge-building communities came into being. Learning at a distance became a social process in which social interaction played an important role in acquiring knowledge through a process of enculturation (Dabbagh & Bannan-Ritland, 2005:7-9).

Because mastering content and skills no longer feature in the forefront, and the learner is expected to manage the overload of information with the applicable thought processes, information skills and learning skills, educational strategies must be followed that pursue the development of these skills in the learner. The easiest way to access information in this era is to make use of information technology as a training medium. In order to use the technology, a certain level of cognitive competence, an ability to manage information, is needed from the learner before he will benefit from the event (De Villiers, 2001:1).

A very important consequence of the advent of the Information Age is the need for instruction to be customised and not standardised. This is necessary as each individual's way of managing information differs. The design of learning packages should be learner-centred and must be contextualised. The latter will add to authenticity, relating the learning experience to the real world. Educators become facilitators empowering learners to build their own knowledge. Both Reigeluth (1996:18) and Winn (1997:37) go so far as to suggest that the design should be so customised that it can actually be changed in real time. This means when the learner uses the material it

allows for immediate changes according to the needs of the learner. Learners become "user designers", with the design happening at the point of use (Reigeluth, 1996:18).

Table 3.1 Differences between the Industrial and Information Age described by Reigeluth (1996:13)

Industrial Age	Information Age
Standardisation	Customisation
Bureaucratic organisation	Team-based approach
Centralised control	Autonomy with accountability
Adversarial relationships	Cooperative relationships
Autocratic decision-making	Shared decision-making
Compliance	Initiative
Conformity	Diversity
One-way communication	Networking
Compartmentalisation	Holism
Parts-oriented	Process-oriented
Planned obsolescence	Total quality
The Chief Executive Officer is king	The customer is king

3.3 COGNITIVE COMPETENCE: A PREREQUISITE FOR UTILISING INFORMATION TECHNOLOGY

Using information technology, e.g. computers, as a training tool removes the teacher from making direct face-to-face contact with the learner and creates physical distance or a situation in which distance education principles apply. Besides being able to be a self-disciplined self-starter, the learner needs to be able to reason and solve problems. His learning capabilities must include the ability to make sense out of constructing new knowledge in a process where he also collaborates with other learners to reflect upon and analyse his newly discovered knowledge and skills.

If learners do not possess these capabilities before starting to use computer technology as a tool for training, educational strategies that will teach them these skills should be built into the training program. Hein (1991) is of the opinion that learning to learn is an inherent characteristic of constructivism as the learner not only constructs meaning but also systems of meaning. In this way following a Constructivist approach will assist the learner to develop theses skills (Filipczak, 1997:37; Ryan *et al.*, 1999:277; De Villiers, 2001:3–4).

3.4 THE DEFINITION OF LEARNING AND ITS COMPONENTS

Various learning theories evolved over the last century due to several psychological experiments being executed in attempts made to determine how learning takes place. No one theory could be proven absolutely as the only exact theory of learning.

All of these experiments concluded that learning takes place when one adopts new behaviour or change existing behaviour to such an extent that it influences future behaviour as well as attitudes. The behavioural changes are permanent and are based on past experiences of the individual. Due to the fact that an adult has such a vast array of experiences, the changes that take place in the adult are a deeper and more meaningful experience than those of a child. Because of this, adult learners should be approached differently than children. The latter fact should also be taken into consideration when planning and delivering adult learning courses (Pont, 1996:43).

To learn can be defined as gaining knowledge or a skill through experience or through being taught. The noun 'learning' indicates deep and wide knowledge gained through studying and reading, as used when we refer to an individual as someone of great learning. A learner is a person involved in the process of learning (Longman, 1987:594).

The word learning can imply three different meanings. When we refer to learning as a completed process, it means a certain product or outcome has been reached. Learning is then the product after the behavioural changes have taken place. Learning can also refer to the processes that take place during the course of learning, namely how learning takes place and the psychological processes associated with it. Learning as a function revolves more around critical factors that make the process of learning happen, for instance motivation and retention (Pont, 1996:43).

There are three types of learning, namely cognitive, affective and psychomotor learning. Cognitive learning deals with facts and knowledge and how to use these. This learning

is mostly imparted by the lecture method, whether it is in the classroom or through private studies. Psychomotor learning involves the physiological skills that are needed to perform a task. This learning normally takes place in a simulated or real situation, for instance learning to drive, while affective learning refers to learning certain attitudes and values. The latter form of learning is difficult to control and measure and is influenced by a variety of aspects, for instance the training style of the trainer, the quality of facilitation, the learning environment and the method used. The insensitive use of learning methods can have harmful effects on learners, causing unwanted attitude changes and values (Pont, 1996:44).

3.5 TOWARDS A THEORETICAL FRAMEWORK OF LEARNING THEORIES

3.5.1 Creating order in a chaos of learning theory

During research on the use of technology as a tool for distance education delivery, it is easy to get lost in the diversity of theories explaining learning, instructional design and distance education. These theories are often at odds with each other and leave educators perplexed, wondering why it is necessary to know anything about theory at all. There is not one single tested and proven truthful answer for how learning takes place, how instruction should be designed, or what guarantees successful distance education. This chaotic situation is compounded by the educator who uses learning theories, the instructional designers who make use of instructional design theory, and the distance educator who also has to consider theories prescribing distance education. This poses a conflicting situation where a decision has to be made about whose theory is correct (De Lisle, 1997) .

In order to resolve what theory to use, one needs to establish what a theory is and consider whether looking for one correct theory is at all possible or sensible. It is a fact that for any learning outcome there is more than one way or method of achieving it. Theory provides explanations for phenomena and can therefore predict changes based on understanding them. Over time, theory can be modified after testing but it can never be established beyond all doubt. If it is widely tested, it is accepted for long periods until disproved. It provides a view or a framework of the world against which the educator can evaluate the method used for training, finding solutions to problems and providing a method for tackling problems (Mergel, 1998).

George (1995:2) describes theory as an attempt to explain the world in a systematic way. It is based on assumptions and consists of concepts, models, definitions and propositions. It is an abstract generalisation of phenomena and consists of at least two concepts and their interrelationship. If it consists of only one concept, it describes the concept and is called descriptive theory. Empirical observations can be deduced from the proposition of interrelationships between concepts. Theory comprises a set of concepts as basic ingredient and a set of statements or propositions explaining the interrelationships amongst the concepts. The propositions must follow a logical, deductive sequence, clearly indicating the path followed to arrive at a new statement (Polit and Hungler, 1999:105–106).

Instructional design, a term common to the e-learning field, deals with the systematic design of learning environments and includes different types of didactic methods and media such as direct instruction, self-instructional textbooks, videos, computer-based training, interactive multimedia and elements of distance education. Duchastel (2003a) highlights instructional design theory as a set of prescriptions that assists the designer in preparation of instruction. It is a descriptive tool underlying the procedural models for design of instruction.

Instructional design models consist of theoretical frameworks that professional educators can use to produce and manage their training. The purpose of these models is to provide a link and build a bridge between learning theories and the practice of building learning environments. The design of authoring tools often by one author with no pedagogical or psychological background unfortunately creates the idea that learning is easy, as you only need to learn how to use the authoring system and learn how to organise the knowledge in a logical sequence. It is, however, a fact that any developer applies some assumptions about learning when designing the instructional tool and therefore the need for theory, and for a comprehensive one at that, establishes itself (Gros *et al.*, 1997:48–50).

Dabbagh and Bannan-Ritland (2005:164) talk about pedagogical models as mechanisms to link theory with practice. They are derived from learning theory and enable implementation of learning strategies. They differ from theory in that they do not portray the deductive system of propositions used to display the logical interrelationships of concepts. A framework or model "broadly presents an understanding of the phenomenon of interest and reflects the assumptions and philosophical

views of the model's designer. A model can be a symbolic representation of the conceptualisations of the phenomena. A framework is the conceptual underpinnings of a study. If a study has its roots in a conceptual model, the framework is called a conceptual framework. If it has its roots in theory, the framework is called a theoretical framework." (George, 1995:10; Polit & Hungler, 1995:107–108 and 110).

The goal of any educator is to get the learner to a point where he retains, understands and actively uses the knowledge and skills that he has been exposed to. It is an effort with the intention to influence the thinking of the learner. In order to achieve this goal, the educator needs to understand how learning takes place before he can plan the learning event. The planned learning event, if structured so that it accommodates the learning process, will promote learning (Perkins, 1992:4).

In understanding learning theory lies the core of designing and implementing distance education. Through understanding theory and building it into the learning design the educator builds a bridge with which the transactional distance of distance education is bridged. To understand learning, educators rely on proven theories of learning to assist them. Various theories on learning have been developed and it can become quite challenging to decide which theory is the right one. In order to understand the value of theories, the educator needs to place them in a bigger picture, model or theoretical framework. A theoretical framework, model or scheme is a combination of concepts arranged in such a manner that it displays the relationships towards each other. The relationships presents itself so that patterns can be observed through the interaction amongst and between the concepts. They portray the relevance of the concepts to a common theme. It is a more understandable and manageable way of organising phenomena.

It is for this reason that the researcher promotes the use of epistemology, namely 'the nature of knowledge" as point of departure in planning learning events. Once the educator understands the nature of the knowledge that he is going to teach, only then can he decide on a theory that will support his learning event. The theory reflects the epistemology. It encompasses one's belief on what is meant by knowing. Adopting a particular epistemology with a consequent supporting theory has the implication that the instructional designer builds this into his design to support the learning process. This implies that conflicting epistemologies cannot be followed in the same instructional design package (Bednar *et al.*, 1992:19; De Lisle, 1997).

There are various approaches towards the categorisation of theories under the two main epistemologies of Objectivism and Constructivism (see table 3.2). Seels (1997), Dabbagh & Bannan-Ritland (2005), Boettcher (1998), Ryder (2006b), Carbonell (2004), the University of Washington (2006) and the University of Berkeley (2006) each classifies theories in different ways. They differ in the grouping of the theories as well as the choice of principal theorists. Besides the most used classification of Objectivism, Cognitivism and Consructivism, where Cognitivism is seen mostly as part of the Constructivist epistemology, other groupings exist e.g. Positivist, Interpretive and Critical theories.

Positivist theories determine laws of cause and effect. They seek a single objective meaning. Interpretive theories focus on the choices one follows to explain human action. These theories look for subjective meanings and try to establish how they are linked to each other. Critical theories look at how social structure affects human action. They look at how meaning is transferred into fixed unchangeable ideologies although they are open to negotiation and are flexible.

Ryder (2006a) does not classify theories according to epistemological approach at all but uses time to sort it, namely into modern and postmodern theories. Dabbagh and Bannan-Ritland (2005) do not see Cognitivism as part of the Constructivist epistemology but approaches it as a separate epistemology somewhere in between, thus she maintains there are three epistemological approaches, namely Objectivism, Cognitivism and Constructivism (Seels, 1997:12; Wilson, 1997a:24 – 25). To add to the confusion, some authors like Ryder (2006a), Wilson *et al*. (1995) and Seels (1997) bring postmodernism as epistemological underlying philosophy into the equation, further compounding the difficulties that the average educationist employee must have in making sense of it all. The basic beliefs of Postmodernism do not differ much from the Constructivist epistemology.

	Epistemology			
Author	**Objectivism**		**Constructivism**	
***Seels* (1997)**	Positive	Interpretive		Critical
Theories	Behaviourist	Cognitive	Constructivist	Post-Modern
***Dabbagh* (2006)**	Objectivism/Behaviourism	Cognitivism/Pragmatism		Constructivism/Interpretivism
Theories and theorists	Pavlov's classical conditioning Skinner's operant conditioning Stimulus-response theory Thorndike's laws of Connectionism. Information processing	Component display theory Dual coding theory Elaboration theory Gestalt theory Mental models Schema theory Subsumption theory		Cognitive flexibility theory General learning theory Knowledge as tools Situated cognition Social-cultural learning
University of Berkeley (2006) – theories	Behaviourism	Cognitive Constructivism		Social Constructivism
Boettcher J.V. (1998)	Behaviourism	Cognitivism		Constructivism
Theorists	Skinner B.F.	Bruner J. and Vygotsky L.		Dewey J. and Knowles
University of Washington (2006)	Behavioural/Objectivist approach		Constructivist/Cognitive approach	
Theorists	Skinner B.F., Mager R.F., Cagne R.M., Merrill M.D.		Dewey J., Vygotsky L. and Piaget J.	
Carbonell L. (2004)	Behavioural	Information processing		Constructivism
Theorists	Skinner B.F.	Miller G.		Dewey, Piaget, Vygotsky, Bruner
Ryder M. (2006b)	Modern prescriptive models		Post-modern Phenomenological models	
	Behaviourism Cognitivism Prescriptive design models		Constructivism	

Table 3.2 A Theoretical Framework of Learning Theories

If one combines the above approaches, it provides a theoretical framework for classifying the various theories. It is the work of the instructional designer to design computer packages in keeping with learning theories. It is the basic foundation of all design, just as engineering is the basic foundation of the architect. Owing to this belief, instructional design theorists link with these theories and draw on them for guidance during the design process (Gros *et al.*, 1997:48; Winn, 1997:37).

The researcher is of the opinion that the above classification is still unnecessarily complicated and is not user-friendly for the average educationist. One should also not complicate the Constructivist approach further by attempting to classify Constructivism into various types of Constructivism as Dougiamus (1998) describes, namely:

- Trivial or personal Constructivism: where knowledge is compiled by the learner and is not passively received from the environment;
- Radical Constructivism: knowing is a dynamic adaptation process towards viable interpretations of experiences. Knowledge does not have to be constructed from the "real" world;
- Social Constructivism: focuses on the important role society plays in the development of an individual;
- Cultural Constructivism: emphasises the wider context of society namely the cultural influences like customs, religion, biology, tools and language;
- Critical Constructivism: addresses reforming existing environments in order to improve the success of Constructivism.
- Constructionism: asserts that Constructivism occurs when the individual constructs something for others to see (Smith & Ragan, 1999: 14-17).

Understanding and applying the finer differences becomes unpractical for vocational training purposes and it is practical and more feasible to focus on the main differences only, namely Objectivism and Constructivism, and to use them as a point of departure for planning learning events. Wilson (1997b) supports this view by stating that "You don't have to be a philosopher to take a position."

Reeves and Harmon (1994:472-505) summarised the contrast between Objectivism and Constructivism in table 3.3.

Table 3.3 Contrast between Objectivism and Constructivism

Category	Old	New
Epistemology	Objectivism	Constructivism
Pedagogical philosophy	Instructionist	Constructivist
Underlying psychology	Behaviourist	Cognitivist
Goal orientation	Sharply focused	Unfocused
Instructional sequencing	Reductionist	Constructivist
Experiential validity	Abstract	Concrete
Role of instructor	Authoritarian	Egalitarian
Value of errors	Errorless learning	Learning from experience
Motivation	Extrinsic	Intrinsic
Structure	High	Low
Learner control	Non existent	Unrestricted
User-activity	Mathemagenic	Generative
Accommodation of individual differences	Non-existent	Multi-faceted
Co-operative learning	Unsupported	Integral

In contrast to the above, Duchastel (2003a) and Reigeluth (1998) believe that theory involves choices rooted in beliefs on what processes underlie learning, what is important to learn and how learning occurs. A theory is a set of theoretical choices and one stance is therefore not always possible, as one may have conflicting epistemologies in one instructional design package. The researcher is of the opinion that it is possible to combine two conflicting epistemologies in one course. Since it is clear that the expectations of the workplace are to meet the demands of the information age, it would be unwise to attempt such an effort. If pressed to do so, one should maintain to a greater extent the epistemology that will meet these demands, namely Constructivism. Cronje (2000) sees the two epistemologies as possibly complementing each other and found through his student's research that both cannot be equally represented in the

same learning event. The latter supports the researcher's opinion that one will have to dominate.

The following aspects further support the researcher's approach of unification of theories in epistemologies as a practical solution:

- Theorists build their theories based on their educational philosophies and educators choose theories based on what they believe are efficient for teaching. This leads to creating islands or silos of beliefs causing conflict on a political, psychological and sociological level in the educational arena. A political problem arises on deciding who is to decide on what to teach the educator or the instructional designer. Duchastel (2003a) reasons that the instructional designer needs to refrain from curriculum theorising, as this is the domain of the educationist. He points out that the instructional design theorist should take whatever the client comes up with as being the goal of instruction and address that goal in some way in his design.
- Conflict on a psychological level exists because of the "fuzziness" of the various learning theories. The instructional designer may be required to abstain from content decisions but he cannot stay uncommitted where learning is concerned. The islands or silos of learning theories are demonstrated by the lack of integration into one comprehensive theory dealing with the relationships between the theories. Since learning theory is not a prescriptive science but a science describing the natural processes in learning there is scope for unification within the study of this phenomenon. The latter supports reasoning that more than one theory can be applied in a learning event. This view is also supported by Wilson (1997b), who warns against creating simple dichotomies and states that neat epistemological categories are not always possible.
- The sociological problem created by the various theories lies in the lack of critical comparisons between the many theorists. Duchastel (2003a) states: "...we have so many theories that cross each other in the dark and are afraid to ask each other the time of day." The need for comparing theories brings opportunities to limit the many theories, some of them inherently being the same, establishing links between them and making them more user friendly. The need to integrate is highlighted by the fact that theorising in the instructional design field is more an analytical process that a process that bring the facts together. The analysis allows

for developing interplaying models for design. Duchastel (2003b) further states: "A good measure of synthesis is needed now in the field to counter the creative but unruly diversity that is emerging from instructional design theory ... only one theory is viable ... Such a theory would show characteristics of fullness: comprehensiveness (its coverage of all domains), abstractness (encompassing all processes), utility (its practical usefulness), validity (grounded in psychology)."

All arguments support the intention of the researcher to move towards an e-learning readiness model that integrates the many theories and look at distance education in an integrative multi-perspective way. This approach in itself supports the basic beliefs of Constructivism as well as Postmodernism (Wilson *et al.,* 1995).

It is therefore the intention of the researcher to highlight the many learning theories, not by describing each but to group them or categorise them according to their epistemological belief of learning.

3.5.2 The three knowledge acquisition models

Before the nature of knowledge (epistemologies) can be discussed, one needs to understand how a human being acquires knowledge. There are three knowledge acquisition models and they have had an impact on the type of learning theories in existence.

3.5.2.1 The Information Processing model (the mind is a computer)

This is also known as the cognitive information process as the human being is seen as a processor of information, like a computer. The mind is seen as a structure with different components, each with certain processing functions, namely sensory registers and short and long-term memory. Information undergoes a series of transformation procedures (storming, retrieving, transforming and using) in these components before it is stored in long-term memory as packages of information. Two characteristics of this approach are the concept referred to above, namely that information undergoes a series of transformations, and secondly the separation of the processing of information and the actual knowledge in the end. The implication for learning is that instructional strategies are followed that assist the learner in processing information, that these strategies are independent from the knowledge being taught and that different strategies are

necessary as different learning outcomes require different cognitive processes (Dabbagh & Bannan-Ritland, 2005:165).

3.5.2.2 The Parallel Distributed processing model (the mind is a brain)

This model is an alternative view of the above model. It differs from it in the sense that the long-term memory is seen as a dynamic network or brain that represents knowledge in patterns or connections with multiple pathways in between. Information processing consists of stimulating the patterns to accommodate the information. The pattern that is most relevant to the information accommodates the information and is strengthened by it. Knowledge is seen as distributed over a network structure in the long-term memory and not as stored in an active connectionist representation, unlike the cognitive information processing model, whose is static and localised. Information processing takes place in parallel, in contradiction with the cognitive information-processing models, where the processing takes place in series (Dabbagh & Bannan-Ritland, 2005:165-166).

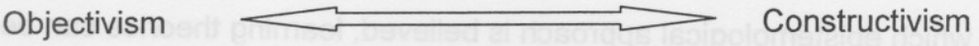
3.5.2.3 The Situated Cognition model (the mind as a rhizome)

A rhizome, a root crop with roots that generate shoots from which new roots and new crops stem, creating an ever-evolving self-organising system. The Situated Cognition model is like the Parallel Distributed processing model with two differences, namely that knowledge is seen as distributed over multiple minds and activities not vested in the individual. Furthermore, knowledge is seen as perception rather than memory, namely how individuals perceive the situation or environment (Dabbagh & Bannan-Ritland, 2005:166).

The implication of these pedagogical models in instruction is that the cognitive information-processing model is consistent with the epistemological assumptions of Objectivism, and the other two with Constructivism. These two epistemologies are contradicting each other and are at the two ends of a continuum. Considering the globalisation of distance education and the reduction in transactional distance due to improved technology, it is evident that knowledge is not situated in one individual or even organisation, but is distributed globally. Therefore, it is sensible and logical to support this assumption with an instructional model and epistemology that assist the learner with strategies to support distributed information processing (Dabbagh & Bannan-Ritland, 2005:167).

3.6 THE EPISTEMOLOGICAL PHILOSOPHIES UNDERPINNING LEARNING THEORIES

Learning theories can be seen as situated on a continuum of two epistemological extremes, namely Objectivism and Constructivism.



3.6.1 The assumptions of the Objectivist epistemology

The objectivist epistemology sees knowledge as stable, exact and unchanging. It exists outside the mind. It is therefore reliable. The learner's task is to gather the exact facts, and the educator must deliver or transmit the facts. It assumes that the same understanding of the knowledge as the educator understands it is gained amongst the learners after it has been transmitted. The mind mirrors the reality of the structured world and all analysis and thought processes around it are determined by the external objective reality of the real world. The goal of education is to teach the learner about the real world. The educator's function is to interpret and transmit world events by telling the learner, whilst the learner is expected to replicate and structure it (Jonassen, 1992:138; Reeves, 2002).

3.6.2 The assumptions of the Constructivist epistemology

Constructivists reason that reality is in the mind of the beholder. It is internally shaped according to the prior experiences of the individual. This implies that there is no single objective real word. There are multiple perspectives of the real world (Wilson *et al.,* 1995; Jonassen, 1992:138–139).

Each educator decides, on the basis of his beliefs, where he is situated on the continuum. Their epistemological views determine their pedagogical views (Hein, 1991). Because programmed instruction and instructional design are more objectivist due to the original limited capabilities of computer technology, it has become more and more Constructivist in approach. Technology and software capabilities have improved significantly, making the latter approaches more and more suitable for instructional design. Together with the move from the Industrial to the Information age, it brought about a shift away from standardisation towards individualisation. This allows for individual differences in learning styles and learner preferences. The aim is to create a

unique learning experience rather than accomplish a single unified outcome (De Lisle, 1997).

3.7 THE MAIN GROUPS OF LEARNING THEORIES AND HOW THEY APPLY TO TRAINING

Based on which epistemological approach is believed, learning theories can be grouped as either Objectivist or Constructivist. According to the Objectivist the nature of knowledge exists outside of cognition, it is clear, correct, and a definitive account of reality. Constructivism disagrees by believing that there is not just one real truth but many, and reality depends on how each individual interprets the world around him (Bednar *et al.*, 1992:22).

The traditional learning theories can be categorised under the Behaviourist (Objectivist) or stimulus-response theories, like the theories of Pavlov, Thorndike, Skinner and Hull, or the Constructivist theories. However although a short description of Objectivist and Cognitivist theories are provided in this thesis the main focus is on Constructivism as definite epistemology of choice for the Information Age. Despite these earlier theories which formed part of the industrialised age there are several new emerging groups of learning theories of the information age which can have implications for the learning environment (Ryder, 2006a).

3.7.1 Objectivist theories (Reinforcement theories, stimulus-response theories, Behaviourism)

The best-known work in developing theories under this group of theories is the classical conditioning experiments done by Pavlov and the operant conditioning experiments carried out by Skinner.

Pavlov discovered that dogs salivate in the presence of an unconnected stimulus if this stimulus was present previously just before the presentation of food. Through combining the original stimulus, namely food, with that of an additional stimulus, a tuning fork, the dogs learned to associate the sound with food.

Skinner discovered that rats through a process of trial and error learn which levers to push in order to receive a reward. In the early stages of the experiment, continued reinforcement was needed to establish the stimulus-response link, which was later

replaced by intermittent reinforcement. This type of operant conditioning is still used to train animals.

These experiments brought valuable insights about the learning process. The steps in the learning process should be short and should flow out of previous steps or learned behaviour. Early learning should be regularly rewarded. Scheduled continuous or intermittent reinforcement plays an important roll in all stages of learning. After successful learning has taken place, the reward should be immediate, without any delay. This feedback process enhances motivation.

The operant conditioning principles of Skinner can be applied effectively in the design of programmed learning and especially underscores the use of computer-based training. Learners are motivated by instant feedback to their responses on a computer. It encourages them to stick to the learning program (Pont, 1996:45-47).

Related to the conditioning theories, Guthrie developed the Contiguity theory according to which a combination of stimuli that was accompanied by a movement will elicit the same movement on the recurrence of such combination. The close association of the stimulus and the response brings about the change in behaviour. Once behaviour stops after a period of time, Guthrie reasons it is not due to the passage of time, but to the interference of other stimuli. This interference causes the behaviour to be unlearned and replaced by new behaviour. This theory sees motivation as a state of arousal or creativity that must be present so that responses can be conditioned (Kearsley, 2005a).

The principles of the Contiguity theory are that for conditioning to take place, the organism must respond or be active. Conditioning implies learning specific behaviour. Therefore, instruction must present specific tasks. In order to create a generalised response the organism must be exposed to a wide variety of stimuli. It is important to make sure that the last response in a stimulus-response situation is the correct one, as that is the one that will be associated (Kearsley, 2005a).

Thorndike, another behavioural educational psychologist, added to the stimulus response theory by establishing his "law of effect" theory. According to this theory, behaviour is learned through trail and error and it is more likely to occur if the consequences are satisfying. (Kearsley, 2005c).

3.7.2 Cognitivist theories

Gestalt psychologists believe that human behaviour is much more complex than a simple stimulus-response reaction. They theorise that there are many internal processes taking place between the stimulus and the response, which brings the learner to new insights. It involves making use of existing knowledge and, by using processes like understanding, analysis, reflection, memorizing, retrieving and so forth, the learner forms new knowledge.

Cognitive theory sees learning as a process of defining problems and seeking solutions through either trial and error and making deductions, or by seeking new information or assistance in order to come to a solution. Once a solution is found, the learning will be transferred to future situations.

We can find the application of this theory in the use of discovery learning or problem solving. The learner comes to new insights through experience in seeking a solution for the problem. For the learner to achieve the objective of training or the targeted insights it is important that the trainer structure the learning experience so that a specific outcome or learning objective can be produced (Pont, 1996:47-48).

3.7.3 Constructivist theories

Ryder (2006a) links a multitude of Constructivist websites together, making it clear once again that there seems to be no limitation to the multitude of theories, whether it be the origin of the theory, learning theory or instructional design theory, concepts and approaches being described as Constructivist. This thesis will highlight only a few of them.

3.7.3.1 Historical background of Constructivism

Hanley (1994) refers to Giambatista Vico as the first Constructivist philosopher, as he mentioned in 1710 that one could only know something if one could explain it. Constructivism has its roots in the approaches of three people, namely Vygotsky, Bruner and Feuerstein.

- **Vygotsky and Piaget (1896–1934)**

  Vygotstky lived in the same era as Piaget (1896–1934). Where Piaget said children's cognitive development follows definite stages of development, Vygotsky

said that it is the product of interaction with the child's culture. Both Vygotsky and Piaget believed that activity as well as social contact is necessary in the construction of meaningful learning (Heylighen, 1997; Cole & Wertsch, 2001). Children acquire their knowledge or thinking from the culture in which they grow up. The culture determines "what" to think and "how" to think. These abilities develop through social interaction, firstly with the parents and thereafter with the community.

Cognitive development is the result of the child's attempts to solve problems. It is thus an active process, not a passive one where knowledge is transferred from the environment. He uses adults (his parents) to guide him. The interaction between them, consisting of dialogue, starts with the parents transmitting knowledge. As the child develops his own language he starts to develop his own internal dialogue and thus starts using this to find his own solutions through a gradual process of internalisation of external influences and internal cognitive processes.

The internal cognitive development of the child is directly linked to and dependent on social interaction with the outside world. Being able to use language is critical as it enables the child to obtain the help of others in his attempts to solve problems. The guidance from others serves as a template or scaffold in organising the child's thoughts when solving problems. Bruner and Ross also stressed this idea in 1976 when they invented the term "scaffolding" to refer to the interaction between adults and children (Kristinsdóttir, 2001a; Dougiamas, 1998).

Vygotsky distinguishes between two competence levels, namely the 'level of actual development', that which the child can do on his own and that which he can do with the guidance of others, namely his 'level of potential development'. The distance in between is called the "zone of proximal" development. The development of this zone is dependent on the social interaction between the child and his parents. The more he takes advantage of using interaction as guidance the better his chances and the better his development. It is thus clear that social interaction is a core component of development and thus of the Constructivist epistemology (Schütz, 2004; Kristinsdóttir; 2001a).

- **Bruner (1915)**

  Bruner was a leading proponent of discovery learning, especially in the field of mathematics. He described the learning process as one where a person discovers regularities between new manipulated materials and existing intuitive regularities from previously internalised material. The discovery is an internal process where existing ideas are reorganised to accommodate and better fit new encounters. This is aligned with the developmental psychology of Jean Piaget and is linked to the Constructivist belief that each individual makes his own sense of learning encounters (Kearsley, 2005b; Kristinsdóttir; 2001b).

  Bruner describes the learning process as going though three stages. The enactive stage where one does something (motor response) based on what one already knows, e.g. driving a car. This is followed by the second stage, namely the iconic mode. This mode deals with the imagery (sensory associations) accompanying perceptions during the phase of sense-making in the individual. The last stage involves the symbolic mode. Through life one adds more symbolic resources and it allows one to reflect on what might be or not be. It relates to an individual's ability to consider propositions, create structure amongst ideas and consider alternatives through trying various combinations (Kearsley, 2005b; Kristinsdóttir; 2001b).

  Bruner also designed the "spiral curriculum" in 1960. It entails the necessity for certain basic pre-knowledge or entry knowledge before one can move on to further knowledge building. To master the breadth and depth of a topic one should work from the simple to the complex, the general to the detailed or the abstract to the concrete. Thus, certain basic principles must be accomplished first as a building block for a next step to complex knowledge This approach is once again characteristic of the knowledge building and sense-making principles of Constructivism (Kearsley, 2005b; Kristinsdóttir; 2001b).

- **Reuven Feuerstein (1970 onwards)**

  Feuerstein is known for his development of the Theory of Structural Cognitive Modifiability. He believes that intelligence is not fixed and can be modified and improved right through life. Higher mental functions are developed though a process of mediation channels used to transmit information to the individual. Based on this theory he developed a programme called instrumental enrichment with which he helped retarded children from dependent thinking styles to

independent thinking. Feuerstein believes that cognitive deficiencies and a lack of intelligence can be corrected in this manner. Again the theme of an inter-generational relationship as channel for mediation is linked to the interaction and collaboration principles of Constructivism (Kristinsdóttir:2001c).

3.8 LEARNING WITH TECHNOLOGY: A CONSTRUCTIVIST PERSPECTIVE

Educators assume that students learn FROM the use of technology during training. However, Constructivists believe that learning takes place through a process of thinking. Technology is just a tool that sets off the thinking processes through which an individual learns. The thinking processes mediate learning. Learning is a result of thinking (Jonassen *et al.*, 1999:2).

Different kinds of activities stimulate different types of thinking and thus different kinds of learning. The activity to learn a poem is different from the activity needed to discuss an opinion. Teachers and technologies can support and create these activities but they cannot cause thinking and therefore learning, as the desire to learn or think must originate from the student. If the student is thinking of something else while the training is happening, no learning will take place. Learners learn through thinking about what they are doing (Jonassen *et al.*, 1999:2).

Technology can support learning if it is used as a tool or partner to stimulate thinking (Jonassen *et al.*, 1999:2).

3.8.1 Constructivist assumptions about learning

3.8.1.1 Introduction: The Constructivists view of learning

The core belief of Constructivism is that the learner constructs his own learning experience by making sense of what he experiences. The sense-making process consists of experiencing a learning event, after which the learner interprets the experience by making use of his existing knowledge and experiences. He then comes to making new sense of the experience within his own framework of knowledge. Through a process of thinking, he reflects and reasons on this new meaning and arrives at new learned material. Each of the various assumptions about learning will be discussed in greater detail in the points that follow (3.8.1.2–3.8.1.11) (Hein, 1991; Jonassen *et al.*, 1999:2).

3.8.1.2 Constructivists believes that knowledge cannot be transmitted

The construction of knowledge is a natural process. The individual does not adopt knowledge through listening to the teacher. He constructs his own knowledge based on prior beliefs and experiences.

The teacher shares his experiences but the individual will never experience and interpret it in exactly the same manner as the teacher. Teaching is a process that gives the learner the opportunity to experience new knowledge and guide him towards making sense of this experience (Jonassen *et al.*, 1999:3; Jonassen *et al.*, 1998:24).

3.8.1.3 The construction of knowledge is derived from activity

Jonassen and Rohrer-Murphy (1999) stress the importance of activity by stating: "Concepts, rules, and theories that are not associated with activity have no meaning. Articulating each of these entities and their dynamic interrelationships is important because the richer the context and the more embedded the conscious thought processes are in that context, the more meaning learners will construct both for the activities and the thought processes." Meaningful knowledge cannot be separated from our experiences of it. Knowing and understanding comes from the individual's interaction with his environment. Memorising knowledge happens in all learning environments, but it does not have a lot of meaning to the learner unless he constructs his own knowledge from it. The best sense-making experiences happens through involving the learner in an activity. This activity does not have to be a physical one, it can be an internal mental process (Hein, 1991; Jonassen *et al.*, 1999:3; Wambach *et al.*, 1999:269).

Knowledge is anchored in the context in which the learning activity occurs. The building of knowledge does not only include new ideas but also information of the context in which these ideas formation took place. Learning is situated in real life and learning events should therefore be contextualised (Cronje, 2002).

The learner makes sense of the activity by also including what he expected from the experience, as well as his feelings and what he was doing during the activity. The more involved or interactive the learner, the more knowledge he will derive from the activity. Understanding skills and knowledge comes from applying them or using them. The best way to learn a skill is to apply it initially, and consistently thereafter, in a meaningful setup.

Teaching that abstracts facts or explains concepts without applying them does not lead to a lot of meaningful knowledge construction (Jonassen *et al.*, 1999:4–5; Jonassen, 2001).

Gagnon & Collay (2005) summerise all of the abovementioned by four Constructivist epistemological assumptions on knowledge construction namely:

- the physical construction thereof by active involvement of learners in activities;
- the symbolic construction of knowledge by learners who are designing and making their own representations of their actions;
- the social construction of knowledge by communicating the information as they perceive it, or their meaning making to others; and
- the theoretical construction of knowledge by learner when they explain things they don't understand fully (Gagnon & Collay, 2005).

3.8.1.4 Meaning is in the eye of the beholder

Since each individual has sets of experiences he will attach his own interpretations to all new experiences based on existing perspectives and beliefs. This knowledge can be shared with others but will never be interpreted exactly the same. The closest one can come to sharing the same experience is through a process of negotiating and agreeing on the relative importance and meaning of the knowledge (Jonassen *et al.,* 1999:5).

Objectivist theorists, although they differ from Constructivists as to the nature of knowledge, support this view as they consider the world to exist aside from the experiences and interpretations from individuals. Understanding is to come to know this world and its entities, structure and attributes and the relations that exist amongst them. Understanding of a phenomenon is partial or biased due to the individual's prior experiences and interpretations. The goal is to achieve the correct understanding (Duffy & Jonassen, 1992:2 – 3).

Jonassen (2001) summerises the characteristics on meaningful Constructivist learning as follows:

- It is active. It engages the learner in the processing of information.
- The learner generates/constructs his own knowledge by
    - Experiencing a learning event in particular an activity

* Using his own knowledge of past experiences and his thinking processes, he reflects/compares/analyses and builds new mental models of knowledge.

- Collaborative – communities of learners exist for mutual social support, modeling and exploiting each others skills in the process of solving problems and completing tasks.
- Intentional – learners action are goal directed. The goals are articulated for the learner in the learning environment.
- It is complex. Problems should be ill structured and presented with all the complexities of the real world and should not be oversimplified. It requires the learner to engage in higher order thinking.
- Conversational – learning takes place through exchanging ideas and opinions to come to new conclusions, therefore the need for knowledge building communities.
- Reflective – learners must explain/discuss how they came to conclusions, what strategies they used and what their thought processes were. Reflective on their activities will increase their understanding and ability to apply the new knowledge in different situations (Jonassen, 2001).

3.8.1.5 There are multiple perspectives of the same knowledge

Owing to the fact that each person's living experiences are unique, multiple perspectives are present, built around a specific fact (Jonassen *et al.*, 1999:5).

There is no shared reality. One can never reach the point where two people completely and totally share the exact same understanding. All realities consist of negotiation of the individual with his environment in order to function in that environment. In order to come closer to what the other person understands, one should investigate the experiences that the other person had (Duffy & Jonassen, 1992:3 – 5; Bednar *et al.*, 1992:27–28).

3.8.1.6 Meaning making happens through experiencing dissonance

Dissonance is created between what the learner experiences and what he already believes or has experienced. It requires previous knowledge already assimilated to build on (Hein, 1991). This dissonance raises a question or constitutes a problem. Meaning is derived from solving the problem and constructing new knowledge. By solving the problem, the learner takes ownership of what is learned, and it becomes more relevant

and important as he himself has arrived at the solution (Jonassen, *et al.,* 1999:5 ; Wambach *et al.*, 1999:269).

3.8.1.7 Constructing meaning requires articulation and reflection

Humans as social beings cannot learn unless they reflect on an activity through articulation. Sense-making requires language used for internal self-talk as well as for communicating with others. The articulation can be verbal, visual or an auditory representation of the experience (Hein, 1991; Jonassen *et al.*, 1999:5; Jonassen, 2001; Wambach *et al.*, 1999:269).

3.8.1.8 Constructing meaning results from sharing with others

As humans we share experiences with other people who have similar experiences in order to determine our identity and test the viability of our beliefs. Stories are exchanged and new learning is derived from sharing the experiences of others. These sharing communities form an important part of the learning process in that it gives the learner the opportunity to make sense of what he has experienced (Jonassen *et a*l., 1999:5).

3.8.1.9 Constructing mening is distributed throughout our culture

Our beliefs are also influenced by what we know, and by the culture and community in which we live and which we have adopted. A learning community has it own culture. This culture influences the beliefs of the individual. Through interaction we arrive at new beliefs due to a discourse between the learning community and ourselves.

Those with whom we interact automatically influence knowledge. That is the reason why like-minded people tend to group together. The longer we interact and converse with a group, the more our beliefs are changed in relation to the culture of the group (Jonassen *et al.*, 1999:6).

3.8.1.10 All learning is not created equally

Constructivists do not believe that all meaning, simply because it is constructed personally, is equally valid. The validity of knowledge lies in its viability as it is either accepted or rejected by the community in which the knowledge is articulated. If it reflects the beliefs of the community at that point in time, it is accepted as valid. It may differ from the community's beliefs yet may still be accepted as viable if it is accompanied by new evidence of the reliability of the knowledge (Jonassen *et al.*,1999:6). According to Jonassen *et al.*, (1999) and Wambach *et al*,. (1999) the

following comparison (Table 3.4) can be made between Constructivism and traditional learning methods:

	Constructivist learning	Traditional learning
Knowledge	Constructed, emergent, situated in action or experience, distributed	Transmitted, external to knower, objective, stable, fixed, decontextualised
Reality	Product of the mind	External to the knower
Meaning	Reflects perceptions and understanding of experiences	Reflects the external world
Symbols	Tools for constructing reality	Represents the world
Learning	Knowledge construction, interpreting the world, constructing meaning, ill-structured, authentic-experiential, articulation-reflection, process-oriented	Knowledge transmission, reflecting what teacher knows, well-structured, abstract-symbolic, encoding-retention-retrieval, product-oriented
Instruction	Reflecting multiple perspectives, increasing complexity, diversity, bottom-up, inductive, apprenticeship, modeling, coaching, exploration, learner-generated	Simplify knowledge, abstract rules, basic first, top-down, deductive, application of symbols, lecturing, tutoring, instructor derived and controlled, individual, competitive
Focus	The learner becomes the focus point around which the instructor, through facilitation, creates a meaningful learning environment so that learning can take place	The instructor is the focus point as transmitter of knowledge
Time	The learner can choose when to learn within a given time period.	The learner can only learn during fixed periods as predetermined by the instructor.

Table 3.4. A comparison between Constructivist and Traditional learning

3.8.1.11 Conclusion: The five interdependent attributes of meaningful learning and their interaction

- **Active (manipulative/observant)**

  The process of human learning is a natural phenomenon. They continually adapt to the environment in order to elicit the required results. Children learning to hit a ball will continuously change their stance to adapt to the environment in order to learn the required skill.

  Learning requires active participation in which the learner actively manipulates the environment and observes the results of his manipulation (Jonassen *et al.*, 1999:8-9). This indicates that technological programmes need more activity than just pressing the spacebar every now and then.

- **Constructive (articulate/reflective)**

  Activity alone is not enough for learning or sense-making. When the learner observes a discrepancy between what he observes and his prior knowledge, he must reflect on the difference and find a solution to integrate his existing world into the new world. If he cannot integrate them, he will set goals in order to gain the knowledge needed to understand or make sense of what is observed. Through this process mental models are constructed to explain the world. These models can become very complex. More complex mental models enable the learner to reason more consistently and productively about observed phenomena (Jonassen, 2001; Jonassen *et al.*, 1999:9).

  Applying this principle in computer programming means that the learner should have several options in trying to solve a problem or discrepancy between what is observed and their existing knowledge. Just having one correct answer or channel to solve a problem is not enough. Constructivists follow two approaches, depending on their belief in how constructive one should be. These are the BIG (beyond information given) and the WIG (without information given) approach. In the BIG approach learners are provided with the information but are left to go beyond it and discover more. They are afforded plentiful opportunities to apply and generalise their understanding. The WIG approach leaves the learner to discover his own knowledge and is facilitated through a process of scaffolding (building step by step). The resources and guidance to do so are provided (Perkins, 1992:50 – 51).

- **Intentional (reflective/regulatory)**

  All human behaviour is intentional because it is directed at achieving a specific goal. When the learner learns with a specific goal in mind he thinks and learns more effectively. Unlike traditional technologies, which allowed the teacher to articulate goals, new technologies should allow learners to articulate their own goals and reflect on the processes used to achieve these goals. This will help the learner to better think about and apply knowledge gained in new situations (Jonassen, 2001; Jonassen *et al.*, 1999:9).

- **Authentic (complex/contextual)**

  It is not advisable to oversimplify ideas in order for the student to grasp the idea or knowledge. All new knowledge is related contextually to a certain complex reality. By simplifying facts the learner learns that the world is a simple reliable place, which is not the case. Learning simple algorithms prevents him from applying this knowledge or relating it to new complex situations, as the has never learned the knowledge in context with the real world.

  Learning tasks in real world situations or through case- or problem-based situations allows the learner to better and consistently transfer the knowledge learned to new situations. Knowledge should be taught in the context of the real world. Various new contexts should be given to the learner for him in which to practise his skills. The learner should be engaged in higher order thinking and not learn oversimplified views of the world (Jonassen, 2001; Jonassen *et al.*, 1999:9–10; Bednar *et al.*,1992:25–26).

- **Cooperative (collaborative/conversational)**

  Human beings naturally learn through knowledge-building communities. We daily exploit skills of others and appropriate knowledge from our peers. This natural behaviour should be supported and enhanced in learning environments. Independent work as traditionally promoted does not promote this natural behaviour and thus limits learning. Even when collaborative learning is promoted by learning institutions it is not followed through, because they still assess students individually. This method teaches the learner that group outcomes are not important, which once again discourages collaborative learning (Jonassen, 2001; Jonassen *et al.*, 1999:10-11). Cronje (2002) sees testing as an integrated function

that should be executed during the process of learning as well as at the end, the product of learning.

Johnson and Johnson (1991) set out three prerequisites for effective co-operative learning; there must be

* a mutual goal;
* positive face-to-face interdependence; and
* individual accountability.

The educator must structure tasks so that the learner is dependent on the group for part of the task, whilst another part should be individual work (Johnson & Johnson, 1991:41).

Through collaborative learning the learner learns that there are many realities and lots of solutions to problems. This realisation allows better application of new knowledge in complex new situations.

Technology allows for setting up learning communities and conversation pools. This should be promoted and exploited to enhance the learning event towards more sense-making and better transferral of learned material.

When planning the learning event the teacher should make use of all five attributes of meaningful learning. They are interdependent and work synergistically together. The total result of using them all will be more meaningful than using them individually (Jonassen *et al.*, 1999:10-11).

3.8.2 The Constructivist's assumption about the use of technology in education.

3.8.2.1 Traditional concepts regarding the use of technology

Since the development of educational TV in the 1950s the trend was to use whichever new technology was developed as a replacement for the teacher. The knowledge was embedded in the technology and the learner learned from the technology. Technology delivered lessons that taught the learner. The assumption was that if you deliver instruction, people would learn. When computers entered the education scene they

were used initially in exactly the same manner. The computer was the teacher and the learner learned through drill-and-practice type exercises.

Since the invention of computer programs, such as word processing and graphic media programs, the emphasis shifted from using computers as a teacher to using it as a productive tool to enhance the educational moment. The growth of the Internet in the 1990s shifted the emphasis to using communication and multimedia as the dominating tool for educational purposes.

Constructivists do not use the computer as a teacher but rather as rich multimedia which the learner can use to learn and represent what he has already learned. Students should use this technology to share what they already know and to find out more about what they do not know, instead of memorising what teachers and textbooks know. The computer is a cognitive tool. The decision-making, problem-solving, planning, application, etc. are the function of the learner and not the computer (Jonassen *et al.*, 1999:11—12; Jonassen *et al.*, 1998:38).

3.8.2.2 The Constructivist's concept of Educational Technologies

When computers are used as technology for training they should not be used as teachers for the learners. Learners cannot learn from computers but should learn with computers as their partners in the learning process. The learner and technology must become one entity in a process of distributed intelligence, with the learner left prominently in charge of the learning process. Learners must be able to do what they does best, which is asking the questions, and the technology must do what it does best, which is receive, store and retrieve data, and not the other way round. When a student learns from a computer the exact opposite happens. The computer asks the questions whilst learners must receive, store and retrieve, in other words doing the exact opposite of what they are supposed to do in order to learn (Jonassen *et al.*, 1999:12 – 14 ; Jonassen *et al.*, 1998:37).

Constructivism assumes that the use of technology is more than the hardware. It includes any process in the learning event that engages the learner in cognitive learning and critical thinking, as well as active, constructive, intentional, authentic and co-operative learning.

Technology on its own is not a conveyer of sense-making nor controls or prescribes learner interaction. However, if it is learner-controlled and learner-initiated it will fulfil,

and should support, learning needs. Technology should support a system by which learners can build more interpretations of meaning and representations of the world.

Technology fosters learning:

- when used as tool to support learning, i.e. for representing ideas;
- if used as a tool to explore or discover new knowledge, i.e. accessing needed information;
- when used to apply knowledge, i.e. simulating situations;
- through collaboration and communication with others, i.e. e-mail;
- if used as a learning partner, i.e. for supporting mindful thinking or off-loading unproductive memorising tasks, allowing the learner to focus on more productive tasks (Jonassen *et al.*, 1999:12–14; Jonassen *et al.*, 1998:38).

In summary, technology will lead to meaningful learning if it engages learners in:

- Construction of knowledge not reproduction of knowledge;
- conversing about knowledge, not receiving knowledge;
- articulation and not repetition of knowledge;
- collaboration and not competition with other learners; and
- opportunities to reflect and not jus accept the prescribed knowledge (Jonassen *et al.*, 1999:16).

3.8.3 Assessing and evaluation according to the Constructivist perspective

Just like learning, assessment and evaluation should also be constructive, authentic, active, co-operative and intentional. The traditional way of assessing is to measure how much knowledge the learner has acquired, with evaluation normally taking place at the end of the learning process. The Constructivist perspective, however, emphasises the use of assessment during the process of learning, namely assessing the various strategies and tactics the learner used to learn and assessing what the learner knows.

Technology can effectively be used for assessment. The learner uses technology to construct a knowledge base, which is then used for assessment. This method allows for assessment during the process of learning. It also teaches the learner that the ways in which he constructs knowledge are important and counts for something, thus further enhancing the use of technology as a tool for learning (Jonassen *et al.*, 1999:15-16).

3.8.4 The Constructivist's learning Environment

A learning environment is a personal or group space in which the learner controls all activities, namely the manipulation of resources or information so as to construct new knowledge in the process of solving a problem. The Constructivist's learning environment makes use of technology as a tool for the learner through which he can explore, experiment, construct, communicate and reflect on new knowledge that is in the process of being compiled.

The technologically supported learning environment, which usually consists of information banks, symbol pads, construction kits, phenomenaria (spaces in which phenomena can be manipulated) and task managers, should be integrated in such a way that the following environments or spaces form the building blocks for the structure of the learning environment:

- A problem or project space;
- a related-cases space;
- a space with information resources;
- a cognitive tools space for knowledge construction;
- a conversation space for knowledge negotiation; and
- a social and contextual support area (Jonassen *et al.*, 1999:195).

3.8.4.1 The problem and projects space

For learning to lead to the construction of meaning, the learner must take ownership of the learning goal or problem. A learning problem must therefore be presented to him. This problem must have the following characteristics:

- It must represent the goal that the learner assumes;
- it must be ill-defined;

- it should be complex so that answers are not readily available. It must have more than one right answer; and
- it must be representative of the actual problems experienced by the field of study.

If the project or problem has these characteristics, the learner will make more sense from the learning because he will take ownership of the problem. If the problem is too well defined, the answers are too easily available. To own a problem, a learner must have the opportunity to identify problems himself, thus experiencing the process of taking ownership of the problem, because he himself has identified it and started thought processes to solve it.

Problems that are too simple lead to only one correct answer. Complex problems have more than one answer and the evaluation of these answers are done through evaluating the learner's higher order thinking processes, namely how he justifies his answer and what the quality of his answer is.

Criticism against this approach is that the student may end up not being exposed to the full breadth of the field of study (curriculum), since he might miss other important information that is part of the curriculum. The Constructivist reasons that quality and depth of study is better than quantity and breadth of study. The amount of knowledge is expanding exponentially daily, whilst the time available to learn everything stays the same. The learner must learn how to manage the knowledge and not try to acquire all the available knowledge. This skill can only be learned through in-depth project or problem investigation (Jonassen *et al.*, 1999:196).

When presenting the problem it should be within the context of the specific subject field, for instance one should consider the specific setting, community or type of organisation in which it occurs. It should be interesting and appealing so as to encourage learner engagement and thus ownership of the problem. It should also be presented in such a way that the learner can manipulate the problem (Jonassen *et al.*, 1999:197).

To summarise the learning environment must;

- Have a problem or project placed in specific context of the real world. The Problems serves as anchoring point form which all learning will rakes place. The problem must be authentic. It must represent the challenges and affordances and the physical settings of the real world situation.

- Engage the learner in a mindful way therefore the learner must be able to manipulate the problem with certain tools, objects and signs to test their hypothesis about the problem.
- Resources like text documents, computers, World Wide Web access, hypermedia applications, animation, sound devices, and other technological devices that are accessible to the learner to solve the problem or project (Jonassen, 2001).

3.8.4.2 Related cases

Meaningful learning requires experience so that mental models can be constructed of how the world operates. The novice learner lacks the experience needed to solve problems presented to him in a learning environment. Providing him with a set of related cases serves as a replacement for this lack of experience. He can now construct new knowledge based on his knowledge of the related cases.

An expert, when presented with a problem, will first draw from his memory of similar experiences he has had in the past and then map the knowledge into the new problem in an attempt to solve it. Related cases provide the novice learner with a memory of experiences that he could not build up for himself through experiencing it, from which he must decide which is applicable to use in order to solve the problem presented to him.

Teachers tend to make new complex knowledge easier for the novice to understand by simplifying it. This prevents the learner from experiencing the ill-structuredness of knowledge application in real world situations. Related cases have the advantage that they represent the complexity inherent to the knowledge domain. Several cases that relate to the problem in different settings prevent oversimplification of knowledge and allow for the learner to experience the conceptual interrelatedness of ideas and their interconnectedness (Jonassen *et al.*, 1999:198).

3.8.4.3 Information resources

While investigating phenomena the learner will need information. Information should be provided through information banks consisting of text, videos, graphic material, hypermedia or any other relevant information sources.

The information resources must be organised in a meaningful way, preferably in such a way that they will support the kind of thinking the learner is expected to do. Information should also be provided when it is needed and not before. Many academic institutions

inhibit meaningful learning by requiring the learning of material without providing a reason or need why it should be learnt by the student.

A Constructivist learning environment provides information banks from which the learner can select the information that is applicable and needed at that moment in time. This just-in-time information contributes to meaningful learning (Jonassen *et al.*, 1999:199).

3.8.4.4 Cognitive (Knowledge-Construction) Tools

Presenting problems to the learner in order to portray the complexity of the real world also brings about the need to perform complex skills. Due to a lack of experience the learner cannot perform these skills and should therefore be provided with cognitive tools to support or scaffold the learner's abilities to perform the skills. Computer technology is the ideal tool to use in providing these cognitive or mind tools for the learner in order to perform the necessary skills (Jonassen *et al.*, 1999:200).

Jonassen (2001) describes three instructional processes (cognitive manipulation tools) that must be part of the learning environment namely, it must:

- Possess modeling namely the demonstration of how and why to perform certain activities needed for tasks required to show learners the reasoning and decision making involved behind each step in completing the task;
- Possess scaffolding (knowledge construction) cognitive tools to assist learners to organise their thoughts into structured arguments, represent their thoughts, automate or supplant thinking skills in the execution of the tasks; and
- Possess coaching where vital information or hints to be used in the completion of the tasks are provided/given to the learner e.g. exactly what figures to consider when calculating the cost of a product (Jonassen, 2001; McKenzie, 1999).

3.8.4.5 Conversation (Knowledge-Negotiation) Tools

Learning most naturally occurs in groups of people and not in isolation. Information is shared and a collaborative attempt is made to construct new knowledge in a team approach to solving problems. Computer technology provides several opportunities through conferencing, e-mail chats, billboards, etcetera through which these conversation communities can be supported (Jonassen *et al.*, 1999:200).

3.8.4.6 Social/contextual support

When implementing Constructivist learning environments, one must make sure that adequate computer and networking facilities are available and that they suit the physical and social environment everywhere. It is no use presenting a video in a room that is not dark enough or if the video is culturally insensitive to the audience. It is also vital that a teacher who understands project-based teaching and can facilitate it supports the programme. It might be necessary to provide support personnel just for the teachers in order to help them understand the Constructivist learning environment (Jonassen *et al.*, 1999:201).

3.9 CONSTRUCTIVISM-BASED PEDAGOGICAL MODELS

A pedagogical model is a framework designed in accordance with specific theoretical constructs and assists the educationist in planning the design of the learning event. Next a summary is provided of some of the most common Constructivist theories and their pedagogical models (Dabbagh, 2005:164).

3.9.1 A process model of adult learning

Although andragogy is not typically identified as a Constructivist theory, the learning behaviour of adults matches many of the Constructivist beliefs and are therefore discussed as an important factor to be consider when designing Constructivist learning events (Thompson, 2006). Andragogy as a learning theory developed after the Second World War. Knowles developed the term in search of a unified theory of adult learning (Knowles, 1970:2). This model concentrates on the process of adult learning which is signified by an increase in self directedness, the tendency to use past experiences to learn, by learners' deciding on their own when they are ready to learn and the tendency to expect learning to speak to their everyday life situations.

Andragogy uses four assumptions which distinguish it from pedagogy. These assumptions appear in table 3.5 below. This process model has many implications for the trainer and must be considered when planning and executing adult learning programmes.

The self-directness of the learning process requires from the trainer to act as facilitator in order to create an environment that harnesses these drives. An informal rather than formal atmosphere tends to work best. A physical and especially psychological climate,

which shows the learner that he is accepted and supported, in which a spirit of mutuality reigns and in which both the teacher and the learner learns, is most effective. Although self-directed, the adult does need support at times. It is the teacher's duty to recognise this early on and to provide support personally or through other group members. The teacher is a change agent (Pont, 1996:48-51; Moore, 1986:19; Brookfield, 1986).

Table 3. 5 Andragogy versus Pedagogy

Assumptions with regard to:	Andragogy	Pedagogy
Concept of the learner	Self-directedness. The teacher's role is to facilitate the self-direction.	Dependent on the teacher The teacher takes responsibility for the learning process.
The role of the learner's experience	Accumulated over a lifetime. Forms resource for new learning for self and others. What they experienced is valued more than what they are told. Experiential techniques are the preferred method of learning.	Little experience is brought to the learning situation. Dependent on opinion of experienced experts. Technique for learning is transmittal.
Readiness to learn	Learn when they feel it is needed. Learning should meet everyday needs and should make life easier. If it is seen as needed, it serves as a motivator to learn.	Learn to obtain adult approval and societal approval. Motivator for learning is fear of failure. Standardised learning according to age groups.
Readiness to learn (continued)	Learning should be organised and sequenced according to each individual's own needs.	Progress is predetermined to suit the group as a whole.
Orientation to learning	Seeks immediate gratification for everyday life. Self-development and achievement in the workplace. Learning must be relevant and applicable.	Deferred gratification applies as learning is subject-orientated and seldom applicable to everyday life Benefit of learning comes much later in life, if ever.

(Brookfield, 1986; Camargo *et al.*, 2006; Fidishun, 2006; Knowles, 1970:39 – 49; Pont, 1996:49).

Individuals come from different backgrounds and their experience should be used to the advantage of the learning experience. Denying these experiences of the group denies the individual the experience. It also denies the group these valuable inputs. Methods for training must move away from trying to transmit knowledge towards discovery learning using experiential, problem-solving and field projects as techniques for discovery, which means active involvement is required (Mendelsohn, 2006).

Using this participative method is advocated because everybody benefits from the individual's experience, including the teacher. Having the experience sets off a learning cycle. The experience widens the span of attention and deepens the learning experience. Participation in the experience includes experiencing certain emotions, which brings about changes in attitude (Pont, 1996:48-51; Carlson, 1989).

In order to ensure relevance and commitment to the learning programme, the learner should be involved in the planning of the programme. This can be done through self-diagnosis, namely evaluating which competencies he needs and comparing it with where he currently stands. A strategy can then be worked out as to how to get to the needed competencies (Moore, 1986:19).

If learning material is presented with the learner in the passive mode, several opportunities should be sought to reinforce the learning. Various reinforcement methods must be used to stimulate and make the learner more receptive to learning. The learner must track his own progress towards the educational goal by gathering the evidence thereof.

The Andragogical teacher sets procedures in place so as to involve the learner in a process of creating a conducive climate for learning, setting up strategies for mutual planning, and determining the needs of the learner. He sets up goals for learning to harness the content of learning, deciding on which learning experiences to use and which not. In implementing the learning experiences, suitable techniques are chosen. He assesses the outcomes achieved and plans for further training according to the outcomes. He acts as a resource for the learner and a co-enquirer, and he does not try to make the other person learn.

Because this process requires the learner to be involved in his own learning it enhances commitment and intrinsic motivation and thus promotes attitudinal changes (Pont, 1996:48-51; Moore, 1986:19; Carlson, 1989).

3.9.2 The experiential learning theory underpinning the problem-based and action-learning pedagogical model

The experiential learning theory has its roots in training in the laboratory. It considers the experiences of the learner as the starting point of learning. After the experience, the learner uses analytical mental processes to try and understand the experience. The new insight gained in this way as well as the emotional experience as part of the learning process brings about behavioural changes.

David Kolb, who developed the experiential learning cycle in 1970, explained it as the cause of the various learning styles that one finds. The experiential learning cycle starts with an experience, which is followed by a period of reflection and data collection around the experience. A third stage follows that involves analysis and forming concepts around the experience. The last stage involves trying out the new concepts or generalisations to see if they work (Johnson, 2001).

This theory underpins action learning and problem-based learning, which are often used in management training. Action learning presents the learner with a problem and allows him to use his own experiences to solve it. The problem drives all learning, and instruction begins with a problem to be solved and not content to be mastered. The outcome of the process as well as the process itself serves as learning vehicles for all contributors in solving the problem (Dabbagh & Bannan-Ritland, 2005:171; Pont, 1996:51–54). Action learning is different from problem-based learning in that:

- There is a real problem and learning is centred around finding a solution for it;
- learning is voluntary and learner-driven;
- development of the individual is as important as finding the solution to the problem;
- it is a visible social process leading to real change in a organisation; and
- it takes time to solve the problem and can take 4–9 months without implementation of the solution.

The elements of action learning consist of:

- A problem – non-technical in nature dealing with strategic or tactical issues. The participants must feel solving it matters to them;
- a set of four to six competent, committed learners with a range of expertise;
- a client who owns or experiences the problem;
- a specific advisor or facilitator who explains the process, builds appropriate interpersonal skills and maintains communication with the client; and
- a process that includes observing and reflecting on the problem and finding a solution that leads to action (Dabbagh, 2006).

However, in problem-based learning ideas for an initial problem-related learning experience includes for example fieldwork, simulations and games, films, role-plays, self-tests, surveys, case studies demonstrations, reading texts, etcetera (White, 1997; Johnson, 2001). Reflective activities include writing journals, discussions, brainstorming, questions, interviews, etcetera, whilst activities assisting in generalising can be the comparison of experiences, identifying key terms, building a model, writing a paper, drawing an analogy, imagining possibilities, etcetera (Johnson, 2001). The problem can be used in five different ways, namely:

- The problem is a guide presented to gain attention prior to presenting the lesson;
- the problem is used to integrate or test learners' skills after readings have been completed;
- the problem is an example that is integrated into the material to illustrate certain concepts;
- the problem is a vehicle for a process of critical thinking, and finding solutions becomes the lesson in itself; and
- the problem can also be used to stimulate authentic activity, namely developing the necessary skills to solve the problem (Dabbagh, 2006)

Problems should be ill-structured and in a real world context. The benefit is that they help students develop collaborative learning skills, reasoning skills and interpersonal and communication skills, and assist with self-directed strategies. The benefits of problem-based learning include the following:

- It promotes ownership through realistic contextualisation of the problem;
- it does not assume formal prior learning in the content area;
- student-centeredness and group learning are promoted;
- self-directed learning is promoted;
- real-world problems that are ill-structured yet authentic are promoted
- problem-solving is the primary learning goal;
- self-reflection is the primary assessment tool;
- it allows learners to generate ideas, set learning goals, apply their own learning strategies and solve the problem by looking for relevant resources;
- it allows the integration, use and re-use of newly learned information in context;
- it supports recursive, iterative cycling through reasoning until a hypothesis is reached; and
- facilitation and scaffolding with the guidance of the facilitator are promoted (Dabbagh & Bannan-Ritland, 2005:171–172; Savery & Duffy, 1995:32–34; Stepien & Gallagher, 1993:25–28).

Examples of problem-based learning can be found at the following web links:

- http://itdev.gmu.edu/projects/ollbook/track/html/index.html Informed consent case study (Dabbagh, 2004a)
- http://web.uvic.ca/history-robinson/indexmsn.html Who killed William Robinson (Sandwell and Lutz, 2006).
- http://nursing.twsu.edu/clp/backpain_preview/index.htm Lower back pain (College of health professions, 2000).

3.9.3 Anchored instruction or situated learning

A group under the leadership of John Bransford developed this theory. Whilst developing videodisc tools for technology-based learning they researched the efficacy of the tool around using a central focal point or anchor. The idea was that the focal point must serve as a catalyst to encourage the student to explore and construct new knowledge and solve realistic problems. Instead of lectures, stories were used. The context of the stories had to be interesting and as realistic as possible and had to reflect the way in which the knowledge will be useful in real-life situations (Dabbagh & Bannan-Ritland, 2005:170; Penn State College of Education, 2006a). The learners must experience the ambiguities, complexities, noise and confusion of the real world.

Situated learning is based on four beliefs, namely:

- Learning arises from the activities of everyday living;
- knowledge is gained in context and can be transferred to similar situations;
- learning takes place through social interaction; and
- learning cannot be separated from the world of action (Dabbagh & Bannan-Ritland, 2005:170).

Dabbagh and Bannan-Ritland (2005:170) and Wilson (1995) summarise the benefits of situated learning as follows:

- Authentic learning takes place through practices that represent real world situations;
- opportunities exist that allow learners to internalise learning and develop self-monitoring and self-correcting skills;
- it supports exploration and interaction within a real-world context;
- inter- and multi-disciplinary learning is supported;
- role-playing activities are promoted;
- it allows information to be sought in the data embedded in the context of the scenario;
- it promotes decision-making and problem-solving skills;

- it promotes collaborative learning; and
- it promotes the transfer of problem-solving skills to real-life situations due to the authenticity of the original learning experience.

Examples or links to anchored instruction can be found at for example the following website, which gives instruction for investigating the impact of an erupting volcano http://volcano.und.nodak.edu/ (University of North Dakota, 2006), or the stories of Jasper Woodbury http://www.ed.psu.edu/nasa/www.htm (Penn State College of Education, 2006b).

3.9.4 Cognitive apprenticeship as pedagogical model

Cognitive apprenticeship as a pedagogical model is similar to anchored instruction, with one difference, namely that the learner is invited into the real-world context to engage in real-world activities e.g. the actual practice of online consultation. Learners interact with experts in the field who guide and coach them. This incorporates strategies like authentic learning, modeling, coaching and fading; however, they emphasise cognitive skills as well as technology-enabled reflection, articulation and exploration. Besides these methods, the following is also common: scaffolding (teacher support to perform a task), sequencing (ordering of learning activities), increasing complexity (increase in difficulty), increasing diversity (practice in different situations) and a global to local skills approach (focus on the whole task before doing its parts) (Dabbagh & Bannan-Ritland, 2005:173; Collins *et al.*, 1991).

This model is ideal for the working environment where workers are expected to be flexible problem-solvers. Human intervention is often needed at the point of breakdown, which means at this point the expert is called in. The focus is on cognitive and metacognitive skills rather than physical skills (Conway, 1997; Dabbagh & Bannan-Ritland, 2005:173; Wilson & Cole, 1991; Snyder, Farrelll & Baker, 2000).

The content of cognitive apprenticeship models consists of domain knowledge – covering the specific subject matter, heuristic strategies – which includes, specific procedures or techniques used to accomplish a task, control strategies – including various strategies used to solve problems, as well as learning strategies – on how to learn different types of skills.

Characteristics of cognitive apprenticeship includes:

- A mentoring coaching relationship between the novice and the expert;
- ideal for modeling and expert performance of the mentor;
- it focuses on mastery of performance in the particular knowledge domain;
- it provides for increasing complexity as the learner grows;
- encouragement of collaborative learning problem-solving, teamwork, testing of multiple roles and confrontation of perceptions;
- learning strategies like reflection, articulation and understanding are supported; and
- it allows for enculturation into authentic practices (Dabbagh & Bannan-Ritland, 2005:173; Wilson & Cole, 1991).

Examples of cognitive apprenticeship are demonstrated by Casey (2002) when describing apprenticeships to study internet crime investigation, as can be found at the following link: http://www.corpus-delicti.com/case_based.html#cognitivea. Another example is the use of groupware-based collaborative learning systems like UNCLE – see link http://www.sloan-c.org/publications/jaln/v5n2/v5n2_wang.asp where online discussion provides the framework for the apprenticeship relationship (Wang, 2001).

3.9.5 Cognitive flexible theory underpinning the cognitive flexibility hypertext pedagogical model

The cognitive flexibility theory, a theory developed by Rand J Spiro, emphasises the complexity of the real world and the ill-structuredness of knowledge. He stressed that ill-structured problems reflecting the real world should be used in training so that the learner can cast and recast knowledge by requiring a response from varying situational demands. He mentions that the oversimplification of problems for convenience sake as a general trend in training has a negative effect on advanced learning. It is suggested that a non- linear and multidimensional traversal of complex subject matter must be used, which can be illustrated as a criss-crossed landscape (Cunningham, 1994; Spiro *et al.*, 1992; Webtech, 2006).

Cognitive flexibility hypertext allows for selectively seeking out knowledge to fit a particular situation. It prefers reflecting the full knowledge domain to avoid reduction and enhance the possibility of finding the right knowledge suited to the situation. It uses many representations of the knowledge domain (case complexity) and ill-structured and complex problems where the concepts that apply to the one do not apply to the other (case irregularity). Cognitive flexibility hypertext is well represented by a hypermedia environment like the world wide web, of which the hyperlinking ability and access to many resources allow for selective use of knowledge.

The benefits of cognitive flexibility hypertext are:

- It promotes active learning by providing for multiple perspectives to explore;
- it supports nonlinear learning through hypermedia technology to stress the inter-relatedness of knowledge;
- cognitive flexibility is exercises by allowing learners to revisit the same material at different times and looking at it from different perspectives, e.g. showing a teaching video more than once but looking at different perspectives, namely first the teacher, then the environment, then the material, etcetera (Boger-Mehall, 1997);
- it promotes theme-based learning;
- it allows for learning of complex content;
- it promotes flexible and reflexive knowledge acquisition;
- it emphasises multiple representations of content that can be restructured in the learner's own meaningful representation; and
- it links abstract concepts to case examples (Dabbagh & Bannan-Ritland, 2005:174 – 176).

An example of this pedagogical model can be found at the following link designed by Bodzin and Park (1999) http://www.ncsu.edu/meridian/jul99/coastal/index.html where learners have to look at environmental problems from different perspectives. The following also serves as an example of cognitive flexibility hypertext training http://mason.gmu.edu/~ndabbagh/wblg/wblframework.html (Dabbagh, 2004b).

3.9.6 Communities of practice or learning communities as pedagogical model

Learning communities consist of groups of people with the same common purpose, specifically a learning purpose. The community shares the same interests and engages in activities exchanging knowledge, values and needs for information. Participants include learners, facilitator(s) and experts in the field of study. The process of learning is transformative, namely it changes the participants, moving them to a higher level of understanding as they share in the goal of learning, knowledge generation and application.

Characteristics of communities of practice are:

- The control of learning is distributed amongst the participants and is not in the hands of the facilitator;
- knowledge generation and sharing of new knowledge is what it is about;
- learning activities are flexible and are negotiated;
- there are high levels of dialogue, interaction, collaboration and negotiation;
- a common goal binds the community and acts as a generator for all to focus and work towards it as a community;
- raising diverse perspectives and issues are appreciated; and
- traditional boundaries regarding discipline and concepts are crossed, whilst innovation and creativity are encouraged (Wilson & Ryder, 1996; Dabbagh & Bannan-Ritland, 2005:175).

Exampes of such communities can be found at the following links http://www.mylanguageexchange.com/ (My language exchange, 2005) as well as http://www.elearningguild.com/index.cfm? and http://www.elearningguild.com/pbuild/linkbuilder.cfm?selection=fol.41 (E-learning guild, 2006). A popular way of starting your own community is by using a web log or blog. A space on a web server is allocated to you for that specific use. Various online blog freeware is available to create your own online community without any cost for instance E-blogger (2006) at http://www.blogger.com/start as well as an example of a blog at

http://www.fullcirc.com/weblog/2004/08/establishing-intranet-community-of.htm (Full Circle associates, 2004).

3.9.7 Computer-supported intentional learning environments (CSILE) as pedagogical model

This model makes use of a collaborative computer-supported learning application, which the learner can use to compile his data and presentations whilst busying himself with reaching a learning goal. It includes generative learning in that various learners can use it to build their knowledge base by using the available scaffolds, media and storing abilities. It is structured so that all learners can share their work, provide comments, change material, ask and answer questions, refine, organise and re-organise their knowledge. The idea of CSILE is for learners to experience real world problems, share their ideas on them, collaborate on which road to follow to solve them, agree on a rationale, record it and set goals, as well as a timeframe to meet them (Dabbagh & Bannan-Ritland, 2005:177-178; Scardamalia & Bereiter, 1994)

Characteristics of CSILE include:

- A group-oriented learning environment where the learner takes responsibility for his own learning;
- it fosters student control as the learner decides on his own learning strategies and how to represent knowledge;
- it promotes intentional learning since the learner not only has to find and represent knowledge in the system but to update it, link it, reorganise it, evaluate and label it;
- through the use of media, multiple ways of representing knowledge is supported;
- it promotes peer evaluation due to the collaborative nature of the environment and everyone's sharing information;
- it promotes teamwork through shared efforts to solve problems;
- it supports individual learning styles;
- provides space for recording he collective database of all learners' thoughts, ideas and understanding; and
- it allows for self-regulation of learning (Dabbagh & Bannan-Ritland, 2005:178).

An example of a CSIL can be found at the following link http://www.ed.gov/pubs/EdReformStudies/EdTech/city.html (Technology and education reform, 2006), as well as http://it.gse.gmu.edu/devise/dvphase4/index.html (Project DEVISE, 2001) and http://www.landmark-project.com/ggl/ (The landmark project, 2006)

3.9.8 Microworlds, simulations and virtual learning environments as pedgogical model

A microworld is a computer environment in which the learner can generate and explore by creating his own scenarios. The learners recreate various scenarios based on their knowledge and skill. Its exploratory nature is accentuated by asking what will happen if learners get the opportunity to retry, and guess the next action steps based on the consequences of previous manipulations. The worlds are structured so that they match the learner's cognitive level and are thus appropriate to his needs.

Microworlds are characterised by the following, namely that it:

- promotes exploratory and experiential learning;
- provides a controlled real-world environment where hypotheses can be tested;
- encourages rich meaningful learning through resembling existing problems;
- allows multiple testing of hypotheses in a short period;
- embodies the simplest model of a domain;
- promotes an initial entry point that is aligned with the learner's cognitive abilities;
- supports the gradual acquisition of more complex skills;
- possesses a wide variety of tools to interact with the environment;
- balances inductive and deductive learning;
- emphasises and encourages the use of errors and incidental learning;
- promotes higher-order thinking;
- provides a learning path from the known to the unknown;
- provides simple ideas grounded in visual reality; and
- supports just-in-time learning (Dabbagh & Bannan-Ritland, 2005: 179-180).

Examples can be found at the following link http://www.microworlds.com/solutions/mwex.html (Global leader in constructivist educational technology, 2006).

Simulations are similar to microworlds in that they are also experiential and exploratory in nature but they differ by placing the learner inside a synthetic environment, e.g. Simcity, at http://simcity.ea.com/ (Electronic arts, 2006), a computer game in which the player/learner have to create his own city. It emulates physical spaces and offices, and people sound as if they are in everyday situations. Simulations can be used to represent very real and powerful three-dimensional environments.

Characteristics of these models are:

- Learning support by engaging learners in action;
- self-regulation by setting their own goals;
- authentic learning experiences;
- learner-centredness and control;
- problem-solving activities;
- accommodating different learning styles; and
- personalisation of learning experiences (Dabbagh & Bannan-Ritland, 2005:181-182)

3.9.9 Conclusion

Only eight of the most prevalent pedagogical models have been discussed so far. There are many more pedagogical models to choose, from e.g. generative learning, discovery learning, inquiry teaching, mind tools, etcetera to name but a few. The Martin Ryder (2006b) website which can be found at http://carbon.cudenver.edu/~mryder/itc_data/idmodels.html as well as the Kearsley's (2005a) at the website http://tip.psychology.org/guthrie.html are helpful in gaining knowledge on the various theories and models. All the previous models have one thing in common, namely that they subscribe to the instructional characteristics of constructivism and support the five design principles of constructivism, namely embedding learning in a realistic context, providing for social negotiation, multiple perspectives, learner

ownership and a knowledge-construction process (Dabbagh & Bannan-Ritland, 2005:183).

It is essential that the employees responsible for training in an organisation understand these models to determine whether it has been incorporated in any training material. Without these principles being present or planned for in the onset towards e-learning the organisation cannot be considered ready for e-learning.

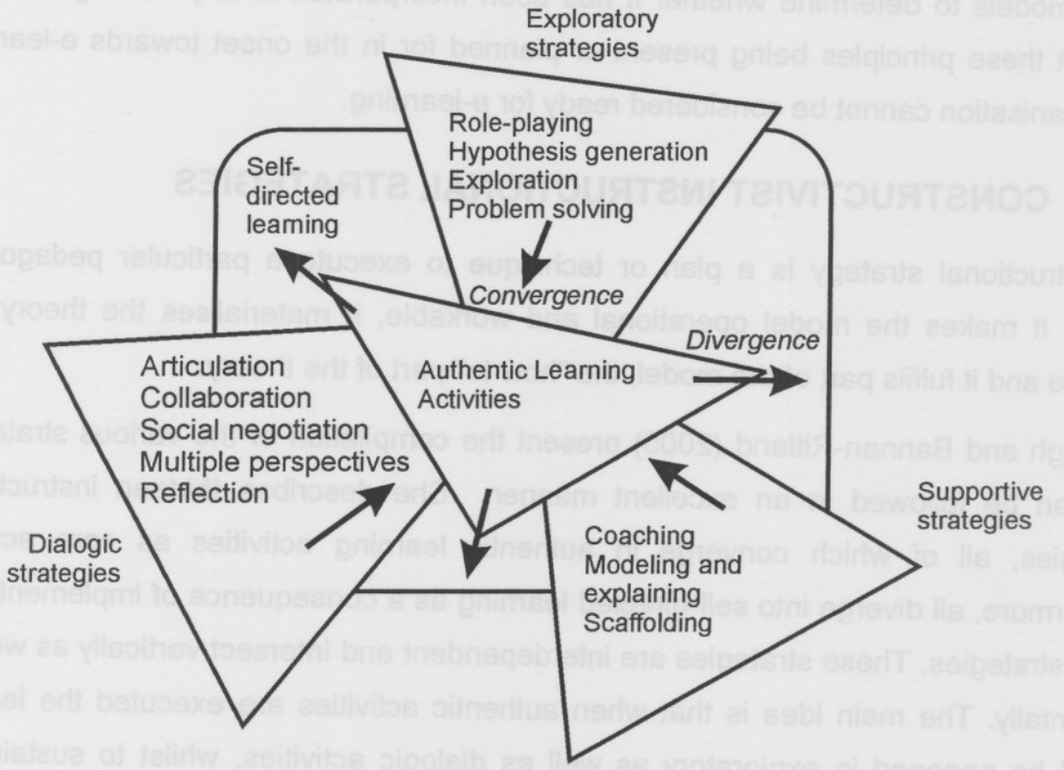
3.10 CONSTRUCTIVIST INSTRUCTIONAL STRATEGIES

An instructional strategy is a plan or technique to execute a particular pedagogical model. It makes the model operational and workable, it materialises the theory into practice and it fulfils part of the model, the "how to" part of the theory.

Dabbagh and Bannan-Ritland (2005) present the compilation of the various strategies that can be followed in an excellent manner. She describes thirteen instructional strategies, all of which converge in authentic learning activities as core activity. Furthermore, all diverge into self-directed learning as a consequence of implementation of the strategies. These strategies are interdependent and intersect vertically as well as horizontally. The main idea is that when authentic activities are executed the learner should be engaged in exploratory as well as dialogic activities, whilst to sustain the authentic learning environment, supportive strategies must be used. For instance, whilst the learner who controls and directs his own learning event tries to solve a real-world problem, e.g. prevent chemical pollution, he reflects on possibilities, generates hypotheses, collaborates with other learners and uses scaffolding templates to record his findings whilst coached by the facilitator (Dabbagh & Bannan-Ritland, 2005:206-208).

Figure 3. 1 Instructional strategies that support Constructivist-based pedagogical models

(Adapted from Dabbagh & Bannan-Ritland, 2005:207 model).



Technologies that support exploratory strategies (see glossary for explanation of terminology) are hypertext or hypermedia, graphics, animation, direct manipulation interface, digital video and audio, authoring tools, search engines, self-contained instructional modules and plug-ins.

Technologies that support dialogic strategies are e-mail, bulletin boards, discussion forums, listserves, computer conferencing, video teleconferencing, document-sharing technologies, groupware, virtual chat, internet relay chat and multi-user domain with text or multimedia.

Technologies that supports supportive strategies are any of the above-mentioned, but in a supportive way, e.g. hypermedia links to similar websites, listserves with experts, video demonstrations of an expert performing a task, coaching in a chat room with facilitator, tracking facilities with hints at critical moments, frequently asked questions, etcetera (Dabbagh & Bannan-Ritland, 2005:184, 208 -225).

3.11 CONCLUSION

Chapter three started by explaining the need for theory in designing learning events. Order in the chaos of theories is created by creating a model simplifying the approach by promulgating an epistemological approach rather than a theoretical approach, since theories have a lot of commonalities and contradicting theories can be combined in one learning event.

Initially clarity on constructivism as epistemology of choice has been set forth and its characteristics discussed. This was followed by presenting various Constructivist pedagogical models and strategies to operationalise the basic approach.

Considering the research question, namely "How is a quality distance training event for the various employees and the employer in their different settings to be ensured" it is clear from this chapter that when an e-learning event is planned, it requires understanding of the purpose of theory as an essential part of the event, as well as how to apply the theory to the best benefit of the employee and the employer, considering the current workplace operating in the Information Age. This chapter explained that following Constructivist pedagogical models in e-learning is crucial in meeting the demands of the Information Age.

Whilst chapter two dealt with the requirements of distance education, and chapter three discussed the requirements for a Constructivist approach, the next chapter will pay more attention to e-learning as a tool for training in a vocational setting.

CHAPTER 4

ELECTRONIC LEARNING (E-LEARNING) FOR TRAINING DELIVERY IN DISTANCE EDUCATION

4.1 INTRODUCTION

In the previous chapter the importance of Constructivism as choice of epistemology for the Information Age has been discussed. In this chapter the researcher will explore the aspects of e-learning that the educator must consider when deciding on whether or not going the e-learning route for training delivery is the right one. The value of e-learning will be determined by comparing e-learning with c-learning (class room learning), and looking at the advantages and disadvantages of e-learning. A discussion will follow on research findings that compared e- with c-learning.

Thereafter a discussion will follow on what to look for when choosing the appropriate distance education delivery system. Emphasis will be place on web-based training systems as the delivery system that can reach all learners and thus have the biggest impact on distance education learning.

This chapter will conclude by describing a holistic three-tiered approach towards implementing a distance education e-learning delivery system as essential to ensuring a successful e-learning event.

4.2 THE NEED FOR EDUCATORS TO OBTAIN E-LEARNING SKILLS

Worldwide we are experiencing an educational transformation period. Newly taught educators will learn more and more about e-learning as educational technology, whilst the older guard will have to sharpen their skills in the educational technology department if they want to be competitive in the changing educational environment. The field of expertise needed to be able to practise both as a specialist in education and as a specialist in the use of educational technology is so big that a natural solution for both groups will be to be a specialist in the one but to understand the other. Owing to the fast technological development – the rule is that the speed of microprocessors doubles

every eighteen months (Saba, 1999b:5) – educators lag behind, and it is easy for them to be exploited by computer companies wanting only to sell their product.

In the last 30 years, both telecommunication and, at the same time, electronic communication have rapidly changed and distance educators have increasingly become reliant on these forms of technology to render a service to learners. The reliability of these systems does not require a high degree of knowledge from learners and educators but it is essential that they know enough of these systems to understand future developments in distance education delivery systems (Saba, 1999b:1).

The dire need for understanding these systems is portrayed by the International Data Corporation, which states: "...Any educational company or institution that ...[does] not have a web deployment strategy ready to roll out over the next six months would lose any competitive edge which they might currently enjoy." (Anon, 2000:18) and also Peter F. Drucker's statement that the World Wide Web's impact on the delivery of distance education is so huge that "Thirty years from now the big campuses will be relics.... It's as large a change as when we first got the printed book... Already we are beginning to deliver more lectures and classes off-campus via satellite or two-way video at a fraction of the cost." (Anon , 1997). The impact that it will have on training is thus compared to the impact of printing on training when it was first invented. Abernathy (1998: 30) eight years ago already reported that various training institutions are presenting courses via satellite or two-way video at a fraction of the cost of traditional classroom training (Abernathy, 1998:30).

Statements like the above highlight the permanent changes that e-learning has brought to the face of the traditional classroom information delivery system. Former educators feel they have become redundant and are unsure as to how to interpret their role in the new technological explosion. The traditionalists cling to classroom facilitation teaching methods, whilst the technologically inclined educationist, realising the enormous advantages of e-learning, has abandoned classroom training and adopted new technological skills so as to present their courseware over the Internet.

Due to the advantages of computer training that lends itself to reaching people over long distances any hour of the day, combining computer technology with distance education is an unavoidable logical next step. This is especially true about web-based training that enables the delivery of material through the Internet to learners all over the globe.

Since distance education can be defined as "...the various forms of study at all levels which are not under the continuous, immediate supervision of tutors present with their learners in lecture rooms or on the same premises, but which, nevertheless, benefit from the planning, guidance and tuition of a tutorial organization" (Holmberg, 1977:9; Keegan, 1980:13; Keegan, 1996:42), one must also realise that this form of education, delivered by the use of computer technology, is not exclusively practised by training institutions. Besides these institutions it is also widely used by employers as a training tool to improve their employees' work place skills.

Although the educator maybe part of a formal training school or part of the training department of an employer, it is essential that they understand the technicalities in the use of the tool so as to ensure that the desired learning outcomes are achieved. A technical error can have a negative impact on achieving the learning outcomes. These technical errors can be quite obvious, like a hyperlink that does not work, or it can be hidden in ill-structured lesson plans or navigation difficulties. If the educator is not able to identify the technical problems, the cause for not achieving the learning outcomes may be erroneously ascribed to learners who do not work hard enough.

However, it is not only the educator who may lack the necessary knowledge on how to use e-learning packages, but often also the computer specialist who in turn lacks educational skills. By combining the skills of a team of experts in the two applicable fields, namely distance education and computer technology, ignorance from the side of both educator and the computer specialist can be overcome (Abernathy, 1998: 30–31).

Considering that distance education through telecommunications was first introduced in 1921 with the issuing of an educational radio licence to the University of Salt Lake City, and the fact that since then it has developed with leaps and bounds to the current worldwide use of wireless transmissions to phones and computers alike, it would be unwise of any educator not to update his technological skills (Baron, 2000: 32; Saba, 1999b: 5).

4.3 THE VALUE OF E-LEARNING AS DELIVERY TOOL IN DISTANCE EDUCATION

One of the first choices the educator needs to make is to decide which of the two main groups of teaching strategies will suit the learning outcomes to be reached best, classroom training (c-learning) or e-learning. If e-learning is chosen, further decisions

are necessary regarding which of the many available training systems will comply with the learning needs. Informed decision-making will only take place if the educator obtains knowledge of the available systems and what they can do.

By comparing the advantages of e-learning with its disadvantages the educator will be able to decide whether e-learning is the best choice for delivery of a particular educational package. Part of this process will also be to consider research done and facing the "no significant difference" phenomenon as result of this research.

4.4 THE ADVANTAGES OF E-LEARNING DELIVERY SYSTEMS

4.4.1 Better delivery of learning programmes

Unlike the preparation of traditional distance education learning packages (training manuals, facilitator manuals, workbooks, etcetera) that takes a lot of time to design, printed and posted, e-learning packages are easier to develop and take less time. If the correct e-learning tool is chosen the educator can alter the learning material immediately on a larger and faster scale than will be possible with traditional distance education. For example if a workplace procedure has changed, changing it on the online training system all current learners as well as previous learners will have immediate access to the new information.

The versatility of the media makes it possible to create authentic training scenarios simulating the real-world scenario, making the learner's transition to the real world easier. Real workplace scenarios can be presented with graphics and video clips and changed often, which is difficult to do otherwise.

Furthermore, e-learning allows for the use of modular architecture in the presentation of study material, making the training paths to be used logical and simplifying repeated access. Training delivery to the end user is easy because of a multi-platform delivery system. Programmes can be developed in such a way that they are compatible with most computer delivery systems, irrespective of which operating system is used by the learner, such as Windows, UNIX or others (Ryan, 1997:21-22; Stone, & Bishop, 1997: 7; Anon, 2000:18).

4.4.2 Access control benefits

Another delivery advantage is the access control options that are available for security purposes, i.e. training programmes can be loaded on private internal networks, making it inaccessible to any users not on the network. It can also be connected to other networks so as to possess greater bandwidth options when it is linked with other training systems (Abernathy *et al.*, 1998: 31).

Because there is access to only one source of information, the exact same material is delivered in the exact same way to each learner, thus ensuring consistency of content and quality of instruction to each learner. E-learning can reach the learner anywhere in the world. It is ideal for situations where the remote learner is not capable of attending a classroom set-up or is a non-traditional learner, i.e. an employee who does not wish to leave his work but still wants to expand his knowledge and skills. Depending on the accessibility it can deliver relevant information just in time. Consider the procedural changes as mentioned in 4.1.1 that can be communicated in time to the whole workplace.

A last advantage is the accessibility of information at *any time*. The Internet as tool for e-learning is excellent in the provision of instant resources to solve possible questions and provide training for workplaces using shift workers through the day. A design can even include a resource library for the learner to refer to, i.e. books, articles, CD-ROMs, other helpful websites, etcetera (Stone & Bishop, 1997:7; Newman & Smith, 1999:44; Anon, 2000:18; Lohmann, 1998:39; Ryan, 1997:21; Galagan, 2000:28).

4.4.3 Cost-saving

There is substantial cost-saving implications for the learner and the provider of e-learning. Mailing costs are reduced through the use of e-mail for the distribution of documents. On top of that, educator fees and expenses are reduced, whilst the efficiency of record-keeping, scheduling and administrative tasks are improved due to built-in computer management control systems. Costs are further reduced by cutting out unnecessary back and forth travelling of employees for on- or off-site training, as well as time away from the job, as they can now receive desktop training.

Although the primary cost of e-learning (lying in the primary design) can be very high, the benefit and long-term cost reduction lies in the delivery and distribution thereafter,

whilst the contrary is true for traditional training. Although, contrary to classroom training, computer-delivered training requires more staff, namely the educator, instructional technologist, media designer, programmer and production manager, as well as the network specialist and support staff for the help desk, there is still a substantial cost saving in a reduction of training time of up to 80% compared to classroom training. Calculating the cost of training or return on investment in training becomes more measurable. Some companies have saved up to 70% of their original training budget.

Other savings lie in the reduction of building costs. A large classroom is not essential for learning as the numbers of learners are not limited to the amount that can fit into a classroom. Large numbers can be trained. If training is delivered asynchronously, that is if it is available on the Internet all hours of the day not requiring same-time interaction with the educator or other learners, it provides training on demand to a wider population, solving the problems of differences in time in different global areas. It also solves the problem of the learner who has to work shifts and is therefore not able to tune in during normal working hours (Meyer *et al.,* 2003; Hilliard & Kemp. 2000:22; Anon, 2000:27; Ryan, 1997:21; Robinson, 2000:35–36; Hubiak, 1998:116–118; Schriver & Giles, 1999:51–52; Stone & Bishop, 1997:7; Ryan *et al.*, 1999:276; Ryan, 1997:18–19; Hartley, 2000:38).

4.4.4 Pedagogical Advantages

E-learning provides a very important pedagogical advantage in that it enhances the total quality of the learning experience of the learner. The Internet allows for collaborative writing of projects and thus collaborative learning. It improves feedback to the learners by speeding it up significantly. It engages the learner through the use of exciting multimedia and the provision of interactivity. The use of e-mail allows for peer host personalities that can entertain, motivate and assist the learners. The individual involvement and responsive feedback provided by using interactive systems are highly motivational. Open-ended learning environments are created, encouraging exploration and problem-solving. The learner thus actively participates in his own learning, and gets the opportunity to take greater control over it. Greater control brings about a greater sense of responsibility spurring the learner on to produce better results.

Another advantage of e-learning is to reinforce learning that has already taken place, thus providing an excellent opportunity for lifelong learning. For instance, consider a

group of learners who learned something as a team. The educator wants to make sure that they can all apply what they have learned. This can be done via interactive engagement of the learner on the subject via computer. It is ideal for employers to use as a tool for maintaining their employees' knowledge and skills. Although the team effort cannot be compared to that of a classroom situation, team sharing and communication are possible. Mutual experiences can be shared via e-mail, chat rooms or the billboard facilities of the Internet. Learning communities can be created where members help each other in the process of learning, for instance by getting feedback from team members on an opinion regarding certain subject matter.

Learning is further enhanced due to the individualisation of the learning experience. E-learning has given learners the opportunity to learn one-on-one, to simulate skills and to try out different options with the added advantage of failing in private without the fear of ridicule from other learners. It ensures mastery of content before progress is allowed.

Learner monitoring and support are better due to the ability of instruction packages to test learner knowledge and track learner progress. It can be designed such that the learner is incapable of proceeding to a next level in his training lest he succeed in achieving a pre-set score in the assessment section of the instructional package.

The capability of designing for maximum navigational control allows for the learner to access, exit and bookmark material in his own preferred way. E-learning is in line with outcomes-based education principles, placing the learner in the centre of events, making him responsible for his own training. He can thus follow his training programme at his own pace in a familiar setting. It also enhances adult learning as a self-directed, self-centred activity that is relevant to the work environment.

Another major benefit is that e-learning accommodates different learning styles. It supports the visual as well as the auditory learner through sound effects, high-resolution text, videos, graphics, animations, tables and diagrams. It also supports kinesthetic learners, who receive their stimulation through interactive hands-on software simulations.

Another advantage of e-learning is its ability to improve the process of learning. The retention of learned material is significantly increased. The process of interaction with material promotes strong reinforcement of material. Through implementation simulation training, excellent experiential learning opportunities can be created, transferring tacit

skills into explicit skills. An example is the aviation simulation technology that Adacel is using to train their air-traffic controllers.

There is a perspective that a gap develops between education of academic institutions and skills training that takes place in the work place. Web-enabled learning at work can be used to close this gap. This is done by allowing the employee to continue his studies and thus keep abreast of times. Web-based training using interactive technology has proven to reduce the learning time, compared to non-interactive learning (Gilbert, 1998:17–19; Hilliard & Kemp, 2000:22; Galagan, 2000:26; Stone & Bishop, 1997:6–7; Newman, & Smith, 1999:44–48; Anon, 2000:18; Jordan, 2000:20; Bischoff *et al.*, 1996:5; Ryan *et al.*, 1999:276; Ryan, 1997:20-22).

4.4.5 Positive social impact of e-learning

E-learning adds social value in that it contributes indirectly to healthier communities through limiting exposure to possible drug trafficking, violence and other crimes that may happen on campuses. Learners sit in virtual classrooms in a cyber-school and are not physically on campus, where they are exposed to the stress of being away from home and the temptation of being free from direct parental supervision and are thus able to try everything (Hilliard & Kemp, 2000:22; Ryan, 1997: 21).

4.5 DISADVANTAGES OF E-LEARNING DELIVERY SYSTEMS

The possible negative effect of e-learning, being a relatively recent development compared to the ancient traditional lecturing, is yet unclear. Assumptions about the negative effects can only be made through considering the influence it might have on individuals holistically by looking at the effect on their normal development as social and spiritual beings (Robinson, 2000:35–36; McCrea *et al.*, 2000:8; Hilliard & Kemp, 2000:24).

4.5.1 Negative social consequences of e-learning

As social creatures, humans do not consider education as just the exchange of information and skills. It is a social event where a lot of debate takes place and skills are practised and demonstrated with the input of other members taking part in the event. Communication through facial expression, voice nuances, direct dialogue and sharing experiences are crucial elements in professional development. Although it involves

technology, e.g. video conferencing to accommodate face-to-face contact, e-learning still does not fully provide for direct hands-on input. Preoccupation with e-learning can deprive learners from developing essential social graces needed for everyday life, such as practising public speaking abilities. Online or Internet addiction is a known phenomena and online websites already exist that are aimed at trying to deal with people affected by the Internet. Some learners just prefer the "edutainment" value of the classroom, which is not the same in e-learning (Centre for online addiction, 2004; Robinson, 2000:35–36; McCrea *et al.*, 2000:8; Hilliard & Kemp, 2000:22–24; Ryan *et al.*, 1999:275).

According to research done by Albert Mehrabian (1971), the impact of communication when the communicator is fully observed is 7% verbal (words only), 38% vocal (voice nuances and other sounds) and 55% non-verbal (facial expression and body movement) (Pease, 1994:5; Farrel, 2000:44). A lot of the impact of communication is lost if the learner is not capable of directly observing the educator. E-learning reduces opportunities for learners to learn from each other. It limits the opportunity to network and use the team to solve problems. Learning through role-play and simulation is reduced and immediate feedback to questions or responses is not always possible (Robinson, 2000:35–36; McCrea *et al.*, 2000:8–9; Aldrich, 2000:38).

Learners also complain of a feeling of isolation due to the lack of direct communication, whilst asynchronous communication causes frustration because there is no flow of communication (Ryan *et al.*, 1999:276). Although technology provides for communication in distance education via chat rooms, graphic material, e-mail, etcetera, the dynamics of face-to-face communication in creating rapport, cohesion and group identity amongst learners are constrained due to the lack of non-verbal cues (Neal, 1999: 43; Merril, 1991: 45 -52).

Expectations of the learner and the provider can differ. Where companies use e-learning for training, the worker may feel that he does not want to interrupt his workflow to study but would rather study at home. The employer on the other hand may expect the learner to study at home whilst the worker feels it is unfair, he should be allowed time off at work to study. It is difficult to strike a happy medium as each person's expectations differ. The Internet, being available anytime and the expectation of life-long learning, have caused an invasion of this technology into time normally spent with the family, as the adult now uses more and more of this time to study. The long-term effect

on normal family life is yet to be determined (Boshier *et al.*, 1999; Robinson, 2000:35–36; McCrea *et al.*, 2000:8; Aldrich, 2000:38).

Certain skills, practical or otherwise, will never be teachable through e-learning e.g. a neurosurgeon cannot possibly learn how to operate on the brain on a computer. The teaching of soft skills and learning how to strategise are equally difficult to teach remotely and are better taught in classroom conditions (Farrel, 2000:44).

Undergoing web-based training in the work environment can be very frustrating as many interruptions occur, e.g. phones ringing or people walking in and out of the office. In the corporate world managers often consider web-based training as the ultimate time-saver, not considering that the learner still needs time off just to sit and learn in front of his computer (Filipczak, 1997: 38)

4.5.2 E-learning requires a specific level of educational readiness before it can be used effectively

E-learning is not necessarily appropriate for all learners. The learner may be computer illiterate or simply not feel comfortable with a computer. This will negatively impact on his learning experience. Although e-learning provides for a variety of learning styles it does not help the learner who leans mostly towards an auditory and kinesthetic learning style as much as real-time learning would. The concept of self-paced learning is often only effective for the highly motivated person. The classroom provides structure for those individuals who lack motivation and confidence to succeed in self-study programmes. Following an e-learning programme requires a great deal of self-discipline or learner autonomy (Robinson, 2000:35–36; McCrea *et al.*, 2000:8– 9; Aldrich, 2000:38).

4.5.3 Technical disadvantages

Distance education can be a problem where not all users have the possibility to access a computer (McCrea *et al.*, 2000:8). It is difficult to control the end users learning environment, e.g. web-based training is not a technologically friendly environment for using videos or audio as tools for instruction. Some end users have limited bandwidth, which causes slow performance of graphic material, which may heighten frustration levels. The cost for the end user can be high when purchasing the necessary equipment

in order to connect to the training site (Ryan, 1997: 22). The same applies to a working environment. Not all workers may have offices with easy access to computers and not all organisation have big enough internal networks (enough bandwidth) to carry the training material, especially if it contains a lot of graphic material.

Technical expertise is necessary in the design of learning packages as boredom can set in if the content is not presented in a pleasant manner with lots of opportunity to interact, for instance when the design consists of a lot of text to read. This is generally referred to as e-reading and not e-learning. (Robinson, 2000:35–36; McCrea *et al.*, 2000:8; Aldrich, 2000:38).

Information overload can happen if the characteristics defining a true learning performance system is ignored or neglected. One can end up with an incoherent collection of information, which is difficult to access and sort through. External factors can also impact on the effective use of the intranet. For instance, the system may have simplified the learning process of searching for information and sense-making to such a point that it deskills the individual (Gilbert, 1998: 20).

New computer technology interventions are developed at a very fast pace. Educators may find it highly frustrating having to design a course just to find as soon as it is finished that there is a better solution. This will obviously impact on the popularity of the course. Learners will naturally choose the better option if it is available. Furthermore the constant progress of technology can cause educators to become so focused on mastering the technology and making it work that they tend to forget the basic principles of good instruction. If it is not present and failure is evident, they can either demand that it be used, or use it as an excuse for bad results. Maintenance of the program can become an expensive time-consuming effort to ensure its comparability with the latest developments on the market (Farrel, 2000: 44; Filipczak, 1997: 39).

4.6 THE "NO SIGNIFICANT DIFFERENCE" PHENOMENON

Although the educator has to consider the positive and negative consequences of e-learning there is a third movement that believes that there is no significant difference in learning irrespective of the media chosen to deliver the training. It is important that the educator see the research findings in the right context before making a decision either for or against e-learning. Where clarity on which delivery system to use has still not been obtained, one can consider using both. This will impact on the total cost to the

company and may not be possible. However, this is the ideal situation as it leaves learners in a position to choose which they prefer.

Research in distance education is done by making use of two different approaches, namely the delivery system approach and the comparative study approach. With the delivery systems approach, delivery means any method used to transfer content to learners. This can include instructor-led training, Web-based training, CD-ROM, books and any other type of delivery available (Kaplan-Leisorson, 2004). The system is derived from applying a certain treatment, for instance making use of educational chat rooms, getting feedback regarding the treatment, like asking learners if it helps, evaluating the feedback and changing the treatment in order to promote desirable outcomes. It focuses on the delivery system as having three main components, namely engagement of the learner, feedback from the learner and evaluation of results against the specific objectives. The various deliveries are compared with each other regarding their use and efficiency. Historically this approach emerged from radar technology used in World War II (Saba, 1999a: 25).

The comparative studies approach has been followed, comparing classroom training with distance learning, most of which results indicate that there is no significant difference between the two delivery systems.

Smith and Dillon (1999b: 7-9), as well as Saba (1999a:24-30), argue that such comparative studies are inaccurate. Too much emphasis is placed on the physical characteristics of the media. It is not the delivery systems that make a difference in the event of learning but the method the media have been used. For instance, in comparing interactive video conferencing with audio-graphics conferencing, the latter includes extra techniques to counteract the occurrence of fatigue due to the lack of visual stimulation. It is therefore not just visual and auditory media that are compared but also different strategies used in the two treatments. It is not the use of the media that is effective but is rather matter of what has been done with the media. Thus comparing the one delivery system with the other is not enough to come to a reliable conclusion of "no significant difference." The application methods of the system must also be considered.

Delivery systems are merely the carriers of various media as supportive to learning. For comparative research to be reliable the researcher needs to adequately define the treatment variable in his research design, and he must describe how these variables

(attributes) might contribute to learning (Smith & Dillon, 1999b: 7-10). This will assist in determining what we really need to know, namely how media contribute to and support the cognitive and social processes of the learner. This view is supported by Saba (1999a:27) who said that '...the key to further understanding media in education in general, and distance education in particular, lies in studying the combination of 'delivery system features', 'medium attributes', and 'instructional potential'."

A further problem with this type of research is demonstrated in the reductionist approach of the research methodology. Individual differences between learner aptitudes and their environment are factored out by the research methodology. The latter does not consider that the human being is no tabula rasa but rather a complex being in which various factors should be considered as part of the learning process. Each learner carries his own "signature" that colours the learning event, and averaging the performance of individuals makes no sense. Merely comparing one delivery system with another does not take al these variables into consideration and makes the "no significant difference" phenomenon not at all reliable (Kelso, 1995:160–161; Saba, 1999a:26–28; Smith, & Dillon, 1999a:33).

Smith and Dillon (1999a:34) argue that neither of the two approaches, the treatment effect approach or the comparative delivery systems approach, can exclusively explain variables of media application in distance education. Both should be used in trying to understand the relationship between the use of media, learning and motivation. Distance education must be examined as a system, but the variables that make up the system also need looking at. Smith and Dillon (1999a) explain this phenomenon as follows: "While systems theory helps us understand how the pieces interact together, comparison studies simply help us understand some of the pieces." (Smith & Dillon, 1999a:34). Using both types of research, in other words research that examines the relationships between variables and also the interrelationships amongst variables, their subsystems and super-systems are important as this approach provides more answers than when they are used in isolation (Smith & Dillon, 1999a:34).

Aptitude Treatment Interaction is a learning theory that supports the above in that it indicates that some instructional strategies are more or less effective for some learners because of their specific abilities or aptitudes. The Aptitude Treatment Interaction theory is based on three principles. Firstly, its proponents believe that aptitudes and instructional treatments interact and that they are influenced by the particular task or

situation. Secondly, they say that highly structured environments work better for learners with lesser ability, and visa versa. Lastly, they refer to the emotional state of the learners, stating that anxious and conforming learners learn better in highly structured environments, whilst non-anxious independent learners prefer low-structured environments (Cronbach & Snow: 2002).

From the foregoing it is clear that the "no significant difference" phenomenon is not a reliable indicator when deciding whether or not to use e-learning. Just comparing delivery systems diverts the attention from what really matters, namely how the learner learns and how one can overcome the barriers created by distance education when learning. These pedagogical and distance education characteristics can never be ignored, irrespective of what delivery system is used.

4.7 E-LEARNING AND THE ADULT LEARNER

Andragogy has been discussed in Chapter 3. However, in this chapter the practicalities of how Andragogy applies to e-learning is discussed. The adult educator needs to know the characteristics of adult learning and how to make computer technology subservient to these principles, and must not allow the use of technology purely for the sake of its versatility.

In general the adult's self-concept has moved from being a dependent personality as a child to being a self-directed human being as an adult. His/her orientation has moved from being subject-centred to being problem-centred. In a classroom-learning environment, adults retrogress to earlier childhood learning, passively expecting to be taught. This makes the educator's function of helping the learner become self-sufficient very difficult. Classrooms are not ideal adult learning environments as adults are physically, socially and psychologically different from children. Adults are also not always enthusiastic about learning in computer labs, where their own inexperience can be obvious to other learners. The tension between self-directness and the desire to be passively exposed to others' expertise brings about behaviour that varies between either doing oneself or being paced every step of the way.

The adult has gathered a reservoir of experiences which, because it is experienced first-hand, is considered to be reliable. They use these experiences as valuable frameworks for learning. The learning process can be increased significantly if the educator succeeds in drawing an analogy between new knowledge and past experiences. It is

because of past experience that adults react differently when exposed to computers as instructional tool. Reactions vary from excited enthusiasm to disabling fear. The same reaction is found amongst educators as the onslaught of new educational technologies threatens their self-image as competent specialists.

Their readiness to learn becomes increasingly more oriented towards developmental tasks that will better their social role. Due to their commitment to the workplace and family, adults prefer "memo style" learning squeezed into short periods. The information must also have already gone through a system of "editorial control", lifting out the most essential content. The child has a time perspective that is aimed at the postponed application of learned knowledge. The adult, however, wants to apply his knowledge immediately towards achieving his personal or work-oriented goals. Learning must thus be relevant and contextualised. This phenomenon is referred to as "just-in-time" learning. If educational technologies are used in such a way that the adult experiences them as a rapid way of achieving all his goals, he will have an added incentive to tolerate the frustrations inherent in learning how to operate the technology (Collins,1999: 13-14; Gilbert, 1998: 20).

A further aspect of adult learning that needs to be confronted is the fact that adults are highly competitive but do not express it in a confrontational manner, like children. The adult learner requires an audience in order to learn. He uses his peers to verify knowledge, thus embedding the final results after having sent them through a filtering process of evaluation. For this reason, great value is placed on collaborative learning. Collaboration implies a process whereby the group of peer learners makes choices. This process favours democracy and gives a feeling of solidarity amongst learners. It further allows the learner to exercise his autonomy, allowing him to share, co-operate and exchange knowledge as he wishes. Collaborative learning can be facilitated by making use of computer-mediated audio, video-conferencing, chat rooms and e-mail. It can also be implemented through setting up discussion groups using e-mail, chat rooms and billboards (Gilbert, 1998:21–22; Collins, 1999:14–18).

Adults have different learning styles, which should be accommodated in the training by assessing the type of learning style at the beginning of a session and designing programmes allowing for progress through the course according to the individual learning styles. Alternatively a design that is versatile enough must be used in order to accommodate all learning styles (Goldstein, 1998: 36). During learning, adults progress

from simplistic stereotypical thinking to greater awareness, with the ability to understand complex concepts and increasingly to tolerate ambiguity.

Adult learners come from diverse cultural environments. It is advisable to be sensitive to the different cultural values by examining assumptions about the right way to do things in order to avoid failure of the planned programme due to dishonouring a specific cultural belief.

When doing an e-learning course it should be remembered not to expect too many technological skills from the learners at first. Initially adults need structure and direction at the beginning of new activities. However, they achieve self-sufficiency much sooner than children. Teaching them these skills is not necessary, it is better to meet their need for "just-in-time" learning by immediately providing them with the technical skills needed. This will allow the adult learner to become more comfortable and confident about his own ability to use a computer effectively.

Sometimes it is difficult for the novice to determine what he needs to learn. It is the educator's duty to make a selection and assist the newcomer in this task. To make optimal use of an Internet site that boosts performance, it is essential that the technical and the conceptual skills of individuals be developed. People should be coached to use the system and encouraged to use reflective practices to allow them to make effective use of the system. Ryder and Wilson (1996) say statement about the use of the Internet, "Since we can no longer filter and select proper materials for our learners, our highest calling as educators will be to support learners in developing such discipline for themselves" (Gilbert, 1998: 21–22; Collins, 1999:14–18).

4.8 CHOOSING AN APPROPRIATE DISTANCE EDUCATION DELIVERY SYSTEM

Once the educator has chosen e-learning as the best option for achieving the learning outcomes in distance education a next step must be taken, namely considering the use of various delivery systems, and in particular how to use them so that they support learning.

There is a wide variety of electronic learning delivery systems to choose from. They can be divided into two main categories, namely local desktop delivery, e.g. computer disc read only (CD ROM) devices or other locally used computer software, local area network delivery (intranet or LAN) or wide area Internet (Internet or WAN) delivery.

Intranets, unlike the Internet, is a closed communication network that is used inside corporations or companies. It can be used in the exact same manner as the Internet, as the advantages and disadvantages are more or less the same.

Dede (1999) distinguishes between seven kinds of interactive media that one can use for distance education, namely synchronous media like face-to-face interaction, videoconferencing, synchronous interaction in a text-based virtual world, shared design-space areas or groupware, and asynchronous media like asynchronous threaded discussions, asynchronous tele-mentoring as well as media that can be both synchronous and asynchronous, like websites structured around ongoing interaction or experiences. He advocates the use of all of them as "...the process of learning is enhanced by broadening the types of instructional messages learners and teachers can exchange. New forms of representations, such as interactive models using visualization and other means of making abstractions tangible and sensory, make possible a broader, more powerful repertoire of pedagogical strategies" (Dede, 1999:16).

From the former it is clear that to choose a particular delivery system, the educator has to have a bigger picture of the different kinds or categories of e-learning in order to understand what is available to him.

One of the best and simplest models the researcher found that clarifies the categories of e-learning and the tools of delivery for e-learning, is the one from Siemens (2004) and World Wide Learn Inc. (2006). (See figure 4.1. for the Siemens model of e-learning categories.) World Wide learn Inc. (2006) distinguishes between ten types of e-learning, namely purely online (no face-to-face meetings), blended learning (online combined with face-to-face meetings), synchronous, asynchronous, instructor-led groups, self-study, self-study with a subject matter expert, web-based, computer-based (CD-ROM) and video or audio learning. They further identify five delivery methods commonly used, namely print, video, audio, review and exams, and communication.

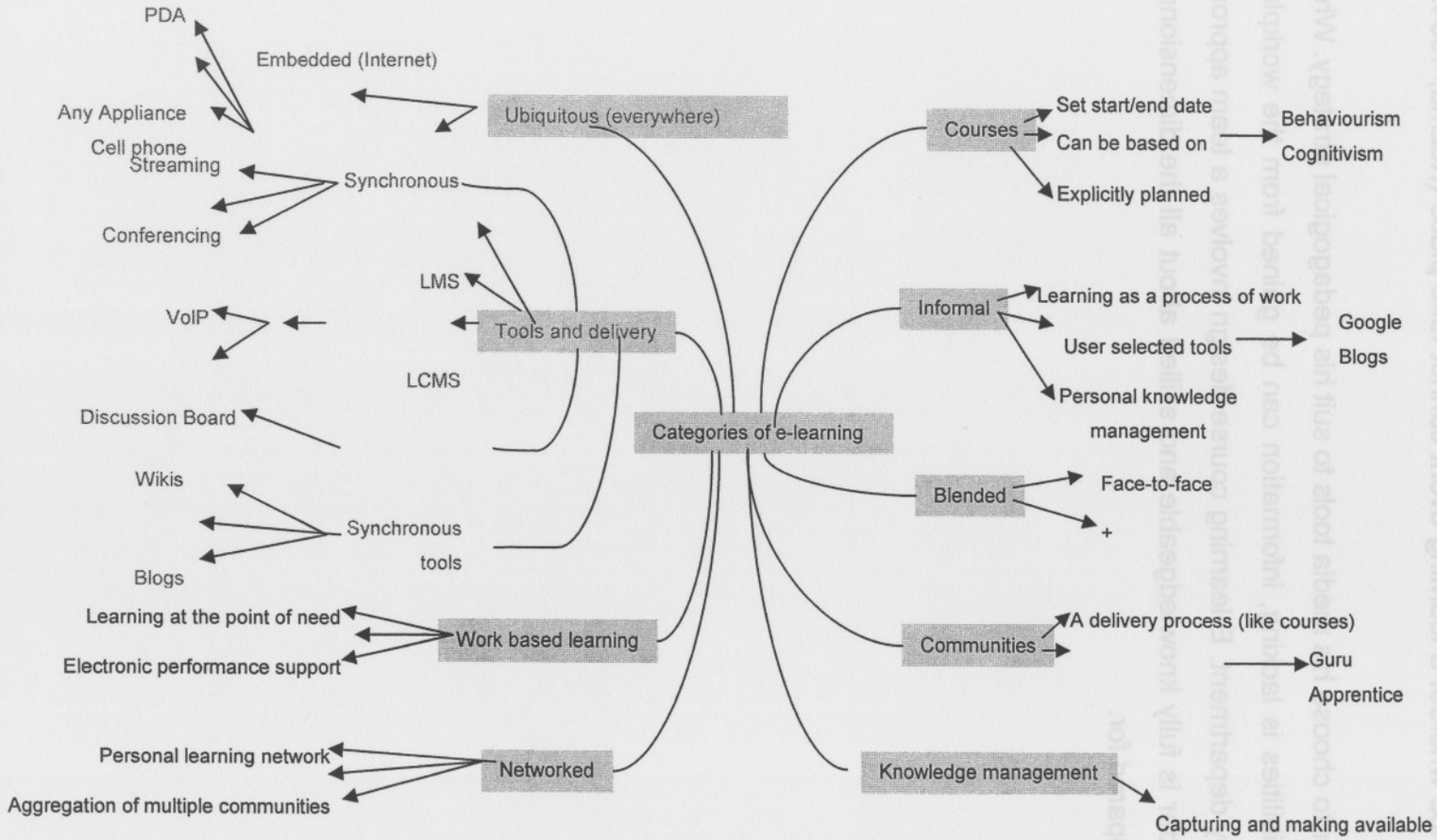
4.9 HOW THE ATTRIBUTES OF MEDIA AND DELIVERY SYSTEMS SUPPORT LEARNING

Media are to be used for their causal mechanism by which they support the cognitive and social processes of learning. They are classified in terms of their cognitively relevant capabilities or attributes. The attributes include technology (physical, mechanical and electronic capabilities, e.g. television), symbol systems (spoken

language, printed text, pictures, numerals, maps, graphs) and processing capabilities (information receival, diplay, storage, organisation, translation, transformation and evaluation) should be considered in deciding how the media can support and enhance learning. The question of 'Do media influence learning?' should rather be rephrased as 'How can media support or enhance learning?' How can they help create the necessary conditions for learning to take place? A necessary condition can be described as that condition in the absence whereof a learning event cannot take place (Kozma, 1994:11, 14; Siemens, 2004).

It is up to the educator to choose his media tools to suit his pedagogical strategy. Where a knowledge of possibilities is lacking, information can be gained from the workplace information technology department. E-learning course design involves a team approach where no team member is fully knowledgeable and skilled about all the dimensions to be developed and prepared for.

Figure 4.1. Siemens' (2004) categories of e-learning (explanation of terms and abbreviations can be found in the glossary)



The researcher differs from Siemens in that the constructivist approach is not only applicable to courses as indicated by his model, but as a pedagogical strategy it can be built into almost any event.

4.10 WEB-BASED TRAINING AS BEST OPTION FOR E-LEARNING DELIVERY

Most of the technologies of today have converged around common technology standards and a generally accepted delivery infrastructure, namely the Internet. Just this one delivery system alone is capable of a wide variety of presentation methods. It could be asynchronous courseware, available 24 hours per day, downloaded to the learners' desktops with or without communication features, or it can be in two-way educator-led audio format. It could also be synchronous, expecting of the learner to be present at a central location at a certain time to receive online training (Barron, 1999: 28).

Web-based training refers to instruction that is delivered via a web browser through the Internet. Other words also used are Internet-based training, web-based learning or web-based instruction. It seems that the generally preferred term is web-based training or WBT. Academic institutions prefer to still use web-based learning and web-based instruction when referring to web-delivered instruction. In the corporate environment this form of training is referred to as desktop delivery (Barron, 1998: 356; Driscoll, 1997: 5; Ryan, 1997: 20).

Driscoll (1997:5) distinguishes between four different models of Web-based training, namely web e-learning, web employee performance support systems, synchronous and asynchronous virtual classrooms:

In web e-learning the training is similar to traditional multimedia computer training using video, audio and animation to transfer knowledge, create understanding and teach how to apply new skills. An advantage above the traditional e-learning is the Internet connection, which allows for communication links and links to background resources (Driscoll, 1997: 7). Besides the multimedia models there are also text-only models, which consist of e-mail correspondence, bulletin boards and text-only downloadable software. This method involves the sending of instructions or assignments via e-mail to the learner, who responds in the same manner. It is accompanied by a prescribed

textbook. Participation in discussion groups is created by signing on to a bulletin board. Mixed models consisting of both media and text are a third option.

Web-based employee performance support systems (EPSS) provide instruction to perform a task at the exact time that it is needed. It has the advantage of avoiding learning needless procedures (Driscoll, 1997: 8).

Asynchronous virtual classrooms create a traditional classroom with hypertext, multi-media, online quizzes, notes of conferences and communication on a web space. The learners do not have to attend the class all at the same time. This model relies a lot on communication to create a sense of a community of learners. In this model the educator is a facilitator and the learner teaches himself with the facilitator's guidance (Driscoll, 1997: 8).

Synchronous virtual classrooms are models where the educational event takes place with the educator and the learner online at the same time. This model is ideal for teaching ill-structured problems like how to diagnose congestive heart failure or how to analyse research data. The educator becomes a co-learner who coordinates the event but does not evaluate the outcome (Driscoll, 1997: 9).

Using the World Wide Web can be preferable to using classroom training and other forms of e-learning. This is best illustrated by an attribute of the Internet called branching. Branching is instruction in which the sequence of instruction is predetermined by prior response. It allows for individual tailoring of training since it adapts to individual pacing needs, selection of instructional events and competency levels. For instance, depending on the learners' responses, they are directed to different instructional events based on their interests, need and level of competency.

The delivery system that relates to branching is called interface. Interface is the seamless access to multiple resources of information or information infrastructure. It provides learner control, allowing the learner to easily move through information to find answers. The better the interface, the more the motivation and learner control over pacing, place and methods of learning. A disadvantage is that it may lead to confusion if the learning is not well directed by the learning programme objectives or the online facilitator/educator.

Pacing is also related to interface and refers to the locus of control for the timing of instructional events. Three types of pacing can be used in learning programmes. Learner-paced instruction allows learners to control the sequence of events and build

their own schemas, thus increasing learner autonomy. These systems may cause learner confusion, accompanied by lower retention rates. Secondly, pacing can be instructionally controlled by the instructional package or the educator. It is accompanied by higher retention rates but does not provide for individual learner differences. Lastly, there is group pacing, which is determined by the group and is a phenomenon of collaborative learning environments.

In conclusion, one can reason that considering the differences found on motivational levels, retention and negative effects of some delivery systems, such as the causing of confusion and limiting retention, following the "no significant" difference route in delivery systems is premature; delivery systems definitely do impact on learning (Smith & Dillon, 1999:15–20).

Besides the versatility of this technology as well as its ability to support adult learning needs, it also supports Constructivist beliefs. The core belief of Constructivism is that the learner constructs his own learning experience by making sense of what he experiences. The sense-making process consists of experiencing a learning event, after which the learner interprets the experience by making use of his existing knowledge and experiences (Jonassen *et al.*, 1999:2; Pont, 1996:47–48).

Considering the constructivist process of learning, the tool to assist learning in distance education should parallel these processes. Computers, and specifically the Internet as information processor, are ideally suited to these purposes. It provides for the need to solve problems, link knowledge, navigate through information and making sense based on own experiences, thus it is capable of creating an ideal learning environment (Cronje, 2002)

Cronje (2002) also points out that the success of the Internet as a learning tool for the delivery of education depends not so much on the technology itself but rather on the instructional design of the programme. The educator needs to know the Internet in order to exploit its possibilities but also has to understand and work around its limitations.

The virtual resource site for teaching with technology of the University of Maryland University College (2005) is a very helpful site for prospective e-learning trainers to help them understand the possibilities available to them. This site explains the use of technology and how it should be used excellently by just asking the following two questions:

- For what do you want to use technology?

  Under this question they discuss teaching and learning activities like concept learning, problem solving, object and document analysis, data gathering and synthesis, virtual labs and field trips, presentations by teachers, presentations by students, and collaborative work.

- What technologies to use?

  Under this section the technologies are neatly categorised from easy to hard to implement. The technologies discussed are asynchronous communication, images, PowerPoint, synchronous communication, text, animated graphics, down-loadable media, repositories, scripts, websites, animations, applets, authoring programs, databases and streaming media (University of Maryland University College, 2005).

4.11 A THREE-TIERED STRATEGY IN SETTING UP A TRAINING PROGRAMME

At this stage it is very important that the vocational educator realise that it is still not possible to just roll out and implement a distance education programme. There is still preliminary planning to be done, before the workplace will be ready for e-learning, which can lead to the failure of the programme if ignored.

Through the researcher's own experience in implementing web-based training and through widespread reading on this topic it became clear to the researcher that to use e-learning a three-tiered approach should be followed to guarantee the success of the programme. The three tiers consist of a basic or fundamental tier, namely preparing the people for the learning event, secondly, preparing the technology for implementing the learning event itself, and lastly and the most important of all, adding educational value to the event and evaluation of the learning event to measure its educational success. This view is supported by Filipczak (1997:38), who comes to the same conclusion where he describes these elements as the necessary sides of a triangle. Without one or more legs you will not have a triangle, i.e. capture the whole picture or have a successful training event. The three elements support each other and ignoring one will impact negatively on the whole e-learning programme.

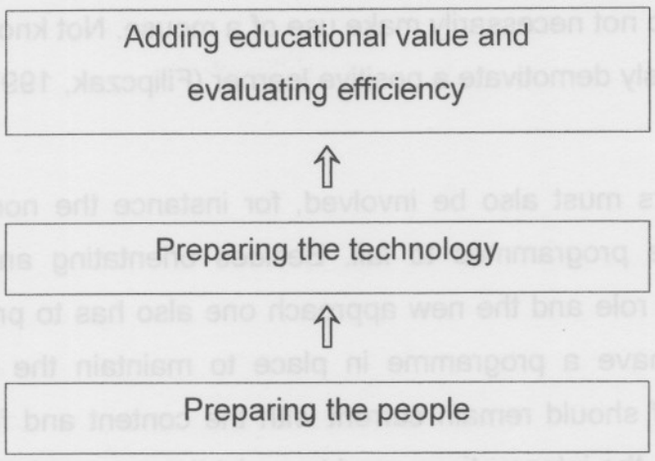


Figure 4.2 The three-tiered approach to implementing distance education programmes

Consequently, online training requires a project team or design team with a project plan, the activities of which can be divided into three different levels of approach. These levels can be managed simultaneously or consecutively. It is also vital that a logical communication structure be put in place in the early stages of planning for all stakeholders to ensure good progress and success of the training strategy (Trenton & Scimeca, 1999:149).

4.11.1 The first tier: Preparing the people

The first and most important element is the human resources dimension. It is vital that the people who are to be trained are mentally ready for the training. They should be prepared for the planned programme and how to use it. All issues regarding there fears and beliefs should be addressed. Learning by means of e-learning can be quite an emotional event, especially if the learner is ignorant with regard to using the technology. They must be informed that their traditional roles have changed and they are now required to portray specific qualities in order to qualify for making a success of the learning event.

One of the major issues to consider when planning for e-learning training is to determine the level of the learners' computer literacy and have training programmes available to bring them to the desired level. E-learning requires learners who are self-starters and self-learners. Even the most experienced computer-literate person might have great difficulty in adapting. Some computer work environments with advanced

computer users do not necessarily make use of a mouse. Not knowing how to operate a mouse can seriously demotivate a positive learner (Filipczak, 1997:37: Ryan, Carlton & Ali, 1999:277).

Other stakeholders must also be involved, for instance the noninvolvement of trade unions can cause programmes to fail. Besides orientating and mentoring learners towards their new role and the new approach one also has to prepare the educator in this regard and have a programme in place to maintain the skills gained through retraining. All staff should remain current with the content and function of the new e-learning approach, the interventions used to assist the user and the extra resources that are available to be used in conjunction with the e-learning event (Sampson, 1999:252).

The traditional school system has trained people for twelve years how to be learners. This system has made us experts on how to behave in a classroom. In using e-learning as an alternative for classroom training the learner needs to learn a whole new set of behaviours, which may not be congruent with his current belief system. This instinctive behaviour often cause many learners to prefer computer training in a computer laboratory, since it feels closer to what they are used to (Filipczak,1997:38).

4.11.1.1 The changed role and duties of the learner

The traditional role of the learner in distance education was to learn on an individual basis. Communication between learners took a minor place. The educator played a central role in the transmitting of knowledge whilst the learner passively absorbed the transmitted content.

Online learning assumes a constructivist approach, namely that learning takes place through a process of communication with other learners. The learner must therefore understand that he must move away from being a passive learner to being an active participating and sharing learner. The key element for the success of online learning is effective interaction. The learner can no longer be a passive participant but becomes an active driver of his own learning, playing a central role in the learning process (Trenton & Scimeca, 1999:146; Jonassen *et al.*, 1999:5).

The depth with which the learner approaches the learning task will also affect his progress, as it has been proven that in distance education , de-structuring and re-structuring knowledge is a helpful skill, whilst the learner who tries to remember as

much as possible from the given text gets frustrated more easily in using distance education packages (Ros, 1998:611).

Distance education requires learner autonomy. Autonomous learners are characterised by the fact that they plan ahead and stick to a plan, modifying it as they go on. They organise their lives by making time for independent study. Autonomous learners realise that they have to give up something to make space for the learning activities but new learning experiences are approached with an open mind, whilst questioning, analysing and testing are enjoyable activities for them. They enjoy reading, writing, listening and discussing things. They do not mind being different. They constantly look for generalisations, principles and basic structure in any subject. Besides having skills in remembering, note-taking and relating, they enjoy being on their own but can also work cooperatively with others (Moore, 1973:668).

Educators need to screen the target group of learners to ensure they possess these qualities. Just allowing everyone, irrespective of having the required character traits, on an e-learning programme may cause high failure rates, demotivation and failure of the programme. Special arrangements must be made for learners who lack these qualities. Providing them with a more structured programme can help them stay with the programme. Alternatively, following a blended approach will also assist them. A blended approach is a mixture of online and face-to-face instruction.

4.11.1.2 The changed role of the educator

When embarking on the e-learning path it is crucial that the educator understand that his educating role has changed drastically from the traditional role. It has changed from imparting of knowledge to being a facilitator of the learning process. Where the educator used to attempt to transmit knowledge, he now facilitates a process whereby the learner discovers new knowledge on his own. The educator used to play a central role in the learning process, whereas now he stands aside and steers a learning process in which the learner plays the central role (Driscoll, 1997:7).

Secondly, the educator becomes a tutor. A tutor, in the true sense of the word, provides one on one learner training. This happens because online educator instruction happens on a one to one basis. The role also involves facilitation of communication processes between learners as well as between the learner and the educational material. Where previously information was communicated by the educator it is now only monitored since it has already been delivered and needs no verbal communication. The educator

plays an initial roll in the selection of information, after which this information only needs augmentation. Consecutive educators play no roll in the selection of information since it has already been done and they only need to augment it. Humanising the technology used or teaching the learners how to use it is part of their daily function (Trenton & Scimeca, 1999:146; Inman *et al.*, 1999:582).

Distance educators need to understand the uniqueness of distance education as well as the uniqueness of the learner with regard to learning preferences and learning styles. Learning preferences include the conditions, modes and content of the learning situation that differs from learner to learner. Learning styles, which refer to the various methods used to process information, also vary from learner to learner . Understanding of these differences will help the distance educator in assisting the learner to adapt his learning strategy to the learning environment (Ros, 1998:611).

Distance education educators need to be positive toward this delivery system and believe in it. Their attitudes vary according to the length of time that they were used to do classroom training and their familiarity with the new technology. If they are familiar with the technology used and have not been exposed to classroom training for very long periods they seem to adapt more easily to the new educating roll required by distance education. The experienced loss of control in distance education which is more prevalent in classroom training also plays a roll in their ability and willingness to change from their old roll to a new roll (Inman *et al.*, 1999:582).

The function of the educator has expanded beyond that of being a content expert and classroom teaching expert to also being a skilled online educator as well as a systems administrator (technological skills). In planning for a model of online training one can include an educator with all these qualities as well as individuals with skills in only one field for extra backup, i.e. a content specialist and a technological specialist (Trenton & Scimeca, 1999:146).

The mediating role of the educator is threefold. As mediator he must act as a go-between between the learner and the knowledge to be internalised. He must create a climate for dialogue so that mediation can take place, as well as encourage independent learner action to develop to a new level of cognition. External stimuli influence our behaviour and cognition. The educator acts as mediator who intentionally seeks out specific stimuli and influences the interaction between the learner and his environment in such a way that the learner can organise and interpret the learning event

more easily. The mediating educator interprets and gives meaning to the stimuli when the learner is confronted with them. The purpose of the mediation is to link the learner's internal cognitive processes with the external world so as to effect behavioural change and develop new cognitive schemata (De Villiers, 2001:18-19).

Besides acting in a role as mediator, the educator can also be a co-learner. The educator creates a climate that is conducive to dialogue so that mediation can take place. This environment is characterised by a climate of co-operation, mutual respect and learningcenteredness. The educator acts as co-learner, guide and democratic authority (De Villiers, 2001:20)

As mediator, the educator should stimulate self-directed learning through correlating his own involvement in the learning event with the learning stage of the learner. The learner is encouraged to develop to a more advanced stage through his own independent actions (De Villiers, 2001:21). Merril (1991:45) argues that retrieval of information is easier if it is organised and elaborated upon during the process of learning. It is the designer of educational programmes' task to guide learners towards organising their own learning, whilst at the same time allowing them to generate elaborations at the time of new learning.

The educator is no longer the director of learning but a resource for learning. As a resource of information, the educator offers advice and help by pointing out various possibilities, but it is still the choice of the learner which advice to use and which to discard. This role is ancillary and supporting, and also anticipating, as all material should be prepared in anticipation of what the learner would need. The learner may still reject material if it does not coincide with his goals. Feedback must also be prepared for anticipated questions in advance of actual questions. Moore (1973:672) describes this phenomenon as follows: "In independent learning and teaching theory, therefore, teaching is thought of a 'a system of behaviours intended to induce learning', but no inducement occurs until the learner himself has already started to behave in the way of a learner, by approaching the work of the educator, already completed perhaps in anticipation of such an approach" (Moore, 1973:670–672).

4.11.1.3 Addressing different learning styles

The general business assumption is that should you give your customer what he wants, you will be in business. Therefore the different learning styles and learner preferences of learners should be considered in the design of an e-learning program. This is not

always feasible, as Nancy Lewis and Peter Orton (2000:46 + 47) state that the learners do not always know what they do not know, meaning in order to add valuable input to the design the learner must know and understand all the variables and features of the e-learning design, as well as know their own learning style. The latter is seldom the case. They go as far as to state that even researchers still do not fully understand the attributes, power, visceral and intellectual appeal of e-learning.

Thus how a person learns may not necessarily determine the effectiveness of e-learning. In order for the learner to assess his preferences he must understand the online learning modalities enough before he can make a judgement. The solution would be to either provide tools to determine the learner preference of learners beforehand to determine whether the design will enhance or frustrate their learning, or alternatively to design the e-learning programme so that it accommodates most if not all of the learning styles.

4.11.1.4 Management of change

Another element that cannot be ignored when implementing a new e-learning program is the method used to disseminate this innovation amongst the learners. The target audience may reject a perfectly excellent innovation just because it has not been introduced correctly. Many an educator makes the mistake of being caught up in their own industry, considering their web training as "cool". They do not consider the fact that the primary interest of distance learners is not to appreciate how neat the training site is, but to achieve their learning goal as soon as possible. When a shift is made from an existing style of training, some marketing must be done to prepare the learner, even if it consists of simple things like putting up posters or distributing leaflets. In order to disseminate the innovation it must target the correct population and it must be promoted amongst these users (Filipczak, 1997:39).

When presenting a new learning innovation to a learner he has to compare it to his existing method of learning. Learners do not know that the new invention may be superior to the old one. It should therefore be shown to them in a process of dissemination. Dissemination must point out the consequences of not changing to a new learning style, compared to the consequences of adopting a new style of learning. This will help learners identify the gap and see the advantages of the new technique. In comparison to their old style of learning they have to resolve issues around questions such as when they are going to do the course, whether they will do it at home, in a

laboratory or at work, whether they have to take notes, and how they will block out time for learning (Aldrich, 2000: 38; Anon, 1998:43).

The new e-learning solution implies change and the same principles as when managing change should be applied. The principles can be summarised as follows:-

- Clarify the *performance gap*. This means showing learners why it is in their best interest to let go of their old learning methods and change to a new learning method.
- Involve all the *stakeholders*. Involve learners in finding solutions for problems during the planning phase already. Make a list of all stakeholders and their relationship towards each other in order to anticipate and plan for the reaction of all involved, even after the first wave of changes had been implemented.
- Everyone should be *informed* of changes to the learning design even after implementation. This communication of change must be early, clearly and consistently repeated.
- Over-*communicate* by constantly exposing learners to developments and constantly explaining processes to help them visualise a positive end result.
- Allow for enough *time* for people to let go of old methods and adopt new methods. It is an emotional process involving saying goodbye, getting angry, psychologically letting go of the known and to mourn its passing (Anon, 1998:43).

Diffusion research indicates five distinctive attributes as strong predictors of acceptance of innovation. They are relative advantage, compatibility, complexity, trialability and observability:

- **Relative advantage**

  This refers to the degree in which the innovation is perceived as better than the old one. For instance, information is easier to access than before, classroom time is reduced, or it is more economically viable since the learner can study without having to pay hostel fees for courses presented on campus (Lewis & Orton, 2000:47–51).

- **Compatibility**

  Compatibility refers to the extent to which the innovation is consistent with the learners' values, life situation, needs and past experiences. For an innovation to be compatible it should require less adjustment from the learner than he previously experienced.

  A programme should be used which the learner generally knows, for instance the Internet. The design should stay constant in all the presenting modules so that the learner finds the use of consecutive modules easier every time (Lewis and Orton, 2000:47–51).

- **Simplicity**

  This attribute refers to the ease with which the innovation can be understood and used. One should consider technical simplicity as well as content simplicity. Using a simple point and click system can enhance technical simplicity. Content simplicity can be obtained by clever modular content chunking.

  Simplicity can be obtained during the design phase of the learning programme by using the input from focus groups to evaluate the degree of simplicity (Lewis & Orton, 2000:47–51).

- **Trialability**

  This provides the opportunity for the learner to "try" the new innovation with no obligation to continually use it. It is an experimental phase, giving the learner a chance to see how it operates.

  This attribute is very important for early adopters who have no precedent. Late adopters have the experiences of their peers to rely on.

  Another important aspect is not to use tracking techniques, which will show user's mistakes. Being able to discover and focus on the learners' weaknesses can add value to the learning process, but during the trial period this option should be removed completely. This will allow the learner to test the innovation in a safe environment without the fear of his mistakes being recorded. The learner must feel comfortable about making mistakes (Lewis & Orton, 2000:47–51).

- **Observability**

  This attribute refers to the extent to which the results of using the innovation are visible to others. It is advisable to first implement quickly demonstrable skills, for instance learning practical tips on running a meeting. The skills that will take longer and are not easily demonstrable should be left for later, for instance the question of what makes a successful leader. The immediately visible effects on users can promote the adoption of the innovation by other learners.

  The above-mentioned attributes must be used in the marketing strategy prior to the introduction of the training programme. Newman and Smith (1999:44–48) used a technique where a group of managers was introduced to an online management programme two weeks before itsstart. They used "teasers" in the form of postcards to pique the managers' interest. The tone was informal and humorous. After that a colour brochure was sent out with more information on the location of the site. The site was also announced on an online staff newsletter with a link to the site. Two weeks after the site had been put into operation, they even sent out chocolates with a site emblem on them to remind managers to use the site.

  Learning preferences play an informative role when it comes to instructional design but do not guarantee success. The five attributes of diffusing an innovation form the critical foundation of successful implementation of new e-learning programmes (Lewis & Orton, 2000:47–51).

4.11.2 The second tier: Preparing the technology

The second most important tier is preparing a technological strategy. A thorough assessment should be made to ensure that the technological infrastructure can carry the programme without interfering with the existing load. A technological maintenance programme should be put into place to support the training programme.

Although it cannot be expected of all educators to be technologically skilled, it is essential that they understand some basics about the planning of processes to be in place before a programme can be implemented. This is needed to ensure success and to avoid exploitation or failure through ignorance. Educators will also be better drivers of and participators in e-learning projects if they have basic knowledge of the technology and the processes used to set it up. The latter is especially true in the workplace, where

training is divided between the training department and the various other departments, one of which is normally a computer technology department. The latter's main function is not education. The two departments need to work together on e-learning projects.

It is often the case that a third party outside the particular workplace is contracted in to drive the e-learning project. In this case the contractor must set up a partnership with the Information Technology Department of the institution and ensure that educators have sound information technology knowledge either to do their own design or to check on the standards of the product delivered by the information technology department. Being a bit of an information technology expert will ensure that the educator's functional requirements for information technology will be clear.

Even if educators want to design their own website they will need the support or approval of the information technology department, or else they may aggravate the information technology department purely through transgressing their standards which they have designed for the organisation, of which they may not be aware (Mayberry, 2000:36; Barron, 2000:32).

4.11.2.1 Building the training programme

Implementing the technological side of the e-learning programme can be done by setting up a project plan and following the steps of the plan one by one or simultaneously, whichever is most suitable and feasible for the organisation in which the programme is to be implemented.

- **Step one: Determining the availability of enough bandwidth**

  A first step will be to determine whether the organisation possesses enough bandwidth to carry the e-learning programme. Lack of enough bandwidth to carry the multimedia that are always needed in training creates a major problem. Download times take longer as the cable network becomes clogged with information.

  One way of solving this problem is to download the multimedia on servers closest to the various learners. In this way the low bandwidth training data can run on the main cables from the training source, while the multimedia run shorter distances from servers further down the line causing less congestion (Filipczak, 1997:37).

- **Step two: Do a needs analysis for the training programme**

  Irrespective of who serves as the project leader of the intended training programme, the private contractor, the information technology department or the training department, all of them meet with the person who is familiar with the training needs and audience for which the course is intended. Information is gathered on the current training situation and possibilities are considered on how online training can meet long-term training needs (Stone & Bishop, 1997:3-5).

  Schriver and Giles (1999:51–52) give the following guidelines: Get management support and find out who will be the sponsor of the programme. Make a decision on who is going to do the actual design, who is going to host it, who will take ownership for the site and where will it reside. Find out if the technical infrastructure is conducive to the design. Find out whether everybody can use the Intranet or if training is needed. Based on this information a decision is made on the scope and method of delivery of the intended course (Stone & Bishop, 1997:3-5).

- **Step three: Determine the content and the design**

  This phase consist of determining the course architecture, namely the "what" must be taught and the design blueprint, as well as the "why" that must be taught.

  To determine the course architecture the instructional designers meet with the subject matter experts to determine what should be taught, in what sequence it should be and what the best course structure will be. The end result will be specific topics, models and lessons in a logical sequence of events.

  The design blueprint consists of deciding how the content will be taught. Designers team up with artists and programmers and they decide on the creative look and feel of the programme. Presentational, navigational and instructional strategies are planned. Viewer interface, screen and menu functionalities are decided upon, based on the content and needs of the audience. Key components are identified and planned, such as tests, record-keeping needs, indexes and glossaries. Flowcharts are developed to indicate the possible pathways through the course. Only after the design and architectural blueprint have been created can a private company, if they are used for the implementation, quote a price on the work to be done.

Once the blueprints are ready they go to the engineering design specialist who once again checks whether the intended playback system will be manageable by the organisations' existing computer system. They define the software development tools to be used, like the authoring language, graphic packages and audio authoring tools. They specify how the course will operate on a detailed level, the navigation, media elements to be used and any other technical issues (Stone & Bishop, 1997:3–4).

- **Step four: The rapid Prototype phase**

A prototype is then rapidly developed and implemented on the suggested hardware and software, demonstrating the chosen design. This phase allows for getting a look and feel of the course early on, and making changes if they seem to be necessary (Stone & Bishop, 1997:3-5).

- **Step five: Storyboarding the course**

This means to write a plan for each separate unit of instruction or topic of the course on a pre-customised template designed for the specific course. One storyboard can be 5–20 pages long. A typical course can have 30 or more storyboards. Storyboards include a description of the overall scene for the topic, a narration script for the sound voice-overs, a script with the onscreen text to be viewed, quizzes and tests to be done on the topic, a description of the visuals to be used, i.e. slides, videos, etcetera, a description of any music or sound effects and sorting all the multimedia by deciding on and creating file names.

The storyboard is a reflection of the whole package in hardcopy format. After completion it is delivered to the project team for editing and approval (Stone & Bishop, 1997:3-5).

- **Step six: Building the production pathway for the course**

A plan setting out the exact pathway and time of each task in the programme should be designed so that it coincides with other related tasks. This is similar to the steps in project management and is aimed at completing the project on time in the most economically viable way.

During this phase it is important to also follow the Development Instructional Systems development principles, which involve "...a systematic approach to

designing, producing, and evaluating multimedia-training programs using a series of logically sequenced steps" (Stone & Bishop, 1997:3–5).

This approach requires constantly asking: Who is the learner, what does he need to learn, what will enable him, what is the best way to teach him this, and how can we be sure that it has been learned? (Stone & Bishop, 1997:3–5).

- **Step seven: Testing the usability of the program**

  As soon as a section of the whole course is completed it should be tested for its usability. A selection of the target audience should test it. Information gathered in this test is invaluable for further development and for ensuring effectiveness of the course.

  If the users indicate during this phase that the programme does not feel right or it is uninteresting it should be considered a reliable opinion and changes should be made to eradicate the problems (Stone & Bishop, 1997:3–5).

- **Step eight: Quality assurance and testing**

  This phase requires using a specially written testing plan to test the whole programme for technical problems or "bugs". After the programme has gone through the system twice without problems it can be rolled out for use (Stone & Bishop, 1997:3-5).

4.11.2.2 Design options for Web-based training

Since web-based training is one of the most popular options for distance education, especially in the workplace, it would serve the educator well to know more about the design options in order to decide on the appropriateness for training or not. Indicators for the use of web-based training will be the need to update information regularly, an audience that is widely dispersed, content that does not rely that much on video and audio, and courses that would benefit from communication from the educator.

There are three different methods in use for the layout of web-based training. In page-based web-based training the information appears on a page with a single scrolling bar used to move through the document. The advantage of such a design is its easy accessibility to a world-wide audience. Most users find it comfortable to use the browser and navigate through the information with the embedded links provided. A disadvantage

of such a design is the need to scroll down the page and a lack of choice of a static menu. An example can be found at http://www.gglearning.com (Barron, 1998:357).

With frame-based web-based training the design provides more than one page in different frames on the same screen. It allows for keeping one or more frames static whilst scrolling through another. The advantage is the ability to keep a frame static, like a menu for instance, while moving others. Disadvantages include the ability to print only the active page and not all the information on the screen. Access time also increases due to multiple pages that must be transmitted. An example of the above can be found at http://www.convergys.com/employeecare_learning.html (Barron, 1998:357–358).

Screen-based web-based training allows for the screen design to look exactly like the traditional computer-based training. An advantage is the removal of all scrolling bars allowing for the whole screen to be filled. A disadvantage is the necessity to download and install plug-ins which may increase the transfer time and stretch memory requirement.

An example of such a site is for instance Standard Bank's site at the following address: https://www.scmb.co.za/servlets/za.co.scmb.www.fetcher.EquitiesPublicFetcher/demo/demo.asp (Barron, 1998:358).

4.11.2.3 Characteristic of a well-designed web-based training programme

Besides following good instructional principles, the educator as the person accountable for ensuring that effective learning takes place, must also be able to identify technical design mistakes in web-based training, as technical inefficiency can cause the training programme to fail. It does not matter whether page-based, frame-based or screen-based web-based training is used, one should always be guided by the principle that the course content as well as good instruction principles must come first and foremost. One should not get lost in the good use of technology at the cost of good instruction (Barron, 1998; 358-359; Driscoll, 1997:5). It is the opinion of the researcher that both technological and instructional principles must be of good quality. Once again this is a partnership where if one of the two is not applied properly or is absent, it will impact negatively on the total package.

Ideas for good instruction and technological principles are:

- In order to get to know learners and for them to get to know each other, the class needs to be humanised. This can be achieved by requests for information of

themselves to be shared on an online whiteboard. Vary the class interaction between lecturing, group activities and exercises. Elicit discussions on the audio line or use text tools for question and answer sessions. Increase experience with the use of online technology by encouraging online interaction between learners outside live educator-led classes (Black, 1998:36).

- Analyse the computer-technological abilities of the target population and browser design that is in use by them. Internal company training is easier to control as it is possible to dictate a specific browser and platform.
- Make the interaction of the web-based training meaningful. Simple use of back and next buttons has no meaningful engagement or educational value.
- Choose your design according to the demands that will be made of the learner. Consider the situation where the knowledge is completely new to the learner. He would probably need much more support and communication than just the computer. Extra contact classes in these cases are advisable. In other situations where the learner has already mastered the knowledge but now needs to change it or add to it, e-learning without contact sessions might be sufficient (Farrell, 2000:46).
- If synchronous online training is used, online time has an effect on concentration. Start with short classes of 30–40 minutes at first. This can slowly be extended to an hour. Concentration diminishes after one hour.
- Set up a help line. If a learner has difficulty with his web navigation he should be able to contact someone immediately for help. Make sure that all learners have the relevant contact numbers in the form of a flyer or a business card before they start. Learners' computers may fail and they might not be able to access the help numbers (Barron, 1998; 358-364; Hipwell, 2000:18).
- Graphics must be used wisely. Use graphics to illustrate concepts as it increases retention and engages the learner. Be sensitive to learners using low resolution systems and keep graphics simple and easily readable. Seriously consider the value of graphics as it increases the transfer time, which can be frustrating, especially if the network traffic is increased. It is easy for inexperienced educators to fall in the trap of overuse of graphics. Limit the size of graphics by limiting colours, using banners rather than full screen pictures and using thumbnails so

that the user can decide whether it is worth his while to enlarge the picture. Compress JPEG (Joint Photographic Expert Group) graphics and limit the colours of GIF (Graphic Interchange Format) pictures. Re-use graphics within a website rather than using unique graphics every time. Unique graphics need to be transmitted from the server every time they are needed, which increases the transmission time. Limit the width of the graphic to the amount of pixels to which most browsers default. Limiting graphics to pixels will ensure no need to scroll through an image.

- Ensure a high contrast between background and foreground. Use a darker background with lighter text to increase readability. Colour matching is essential.
- Use audio and video elements only when they are adding definite value to the training. Limit the size of the file by only incorporating the most relevant sections instead of the whole video. The use of streaming media (streaming audio or video) namely audio or video files played as they are being downloaded over the Internet instead of users having to wait for the entire file to download first, requires that the user download plug-ins, which in themselves can cause major frustrations in use.
- Limit the length of page-based web-based training to avoid long scrolling sessions to access al information. The initial page of any website should never exceed one page in order to ensure easy access to all information. Page-based web-based training can be difficult to print as pages have to be pieced together. This can be avoided by providing a link to a separate printable file (Barron, 1998; 358-364).
- When designing a website consider making sure that the course address is easy to access. Ensure easy, consistent navigation bars between pages and use a colourful outlay. Learners will be discouraged if they have to navigate through several websites before they eventually reach the site they want to access. Icons used for navigation should be appealing and clearly visible (Newman & Smith, 1999:44–48; Aldrich, 2000:38).
- Differentiate amongst hyperlinks to ensure that learners can use them sensibly. Use descriptive words with the link, indicating exactly where it will lead. Provide predictable fixed links like homepage, back, forward and next page. If large files or plug-ins are to be transferred, provide information on the size of the file and links to easily access the download of the plug-in (Barron, 1998; 358-364).

- Foresee the use of needed resources and plan for them, i.e. include the use of case studies to provide opportunity for the learner to observe or apply already learned material. A section can provide schedules on either upcoming test dates or discussion groups. Space should be provided for registration of the learner. Consideration can be given to providing the learner with a user identification and password to ensure privacy and security. Include a privacy policy link on the home page. Many people refuse using sites if the latter is not present (Barron, 1998:358-364; Hipwell, 2000:18; Moran, 2000:32–33; Galagan, 2000:29).

- Have a plan for the installation of security measures to ensure the credibility with regard to the true identity of the learner and the privacy of test banks. Install mechanisms to ensure that the work presented is in fact the learner's property and not someone else's (Schriver & Giles, 1999:51–52).

- Make sure that no copyright laws are breached. Where copyrighted material is to be used, written consent from the owner of the material must be obtained (Abernathy *et al.*, 1999:20).

- For effective web-based training, collaboration should always be included, either asynchronous through e-mail or discussion groups or synchronous through the use of chat rooms or video conferencing. Create opportunities for one on one discussion as well as for group discussions by using the billboard and chat room facility of the net or link buttons that directly link the learner via e-mail to the educator. Ensure feedback to all communication either immediately or at least within 24 hours.

- Support the e-learning with regular communication other than through the Internet. Send flyers, letters or use the telephone to communicate. Using a mix of communication methods is more effective. Arrange for an "online open house". Invite the learner to join meetings on how to benefit from online e-learning and how to use it. Do frequent course evaluation to seek out strengths and weaknesses on which to improve (Barron, 1998:358–364; Hipwell, 2000:18; Moran, 2000:32–33; Galagan, 2000:29).

- Provide basic business contacts within the top two layers of the design. Do not allow visitors past the front page without this basic requirement (Abernathy *et al.*, 1999:16; Aldrich, 2000:38).

- Make sure the programme relates to the character of the subject and the users. Does it look and feel right? If it is a professional site, does it project a professional image? Determine the possibility, the necessity and the method of linking the site to other relevant sites. Make sure that the site is used. The general tone of the training programme should be informal. Notable quotes and humorous examples can be used to keep your learner engaged. Use tools that will invite and keep the learner interested, like jokes, cartoons or interesting video clips (Newman & Smith, 1999:44–48).

- Decide what the definition of victory will be. When will you know you have succeeded? How will the effectiveness of the site be evaluated? Will it be demonstrated through active usage, tests, and learner performance or through success stories? Set up a list of the standards against which the site can be measured for technical efficiency and user friendliness. Decide on the method of evaluation before the launch of the programme. Will you use focus groups to evaluate the site or will you use e-learning experts to evaluate it according to the pre-set standards (Schriver & Giles, 1999:51–52)?

A White Paper of the Business-to-Business E-Learning Industry reported the following criteria as characteristics of a complete e-learning solution. The following table is a direct extraction of these criteria (see table 4.1). An educator can use this to determine whether to buy a pre-designed programme (McCrea, *et al.*, 2000:10).

Table 4.1 The characteristics of a complete e-learning solution as compiled by McCrea *et al.* (2000).

CHARACTERISTICS OF A COMPLETE E-LEARNING SOLUTION	
Assessment and curriculum design and development	Organisational and individual needs assessment. Setting competency standards of performance. Goal setting and incentives. Roadmap to educational success.
Branded educational content	Proven high-quality intellectual capital. Timely, relevant and consistent information. Keeping fast-changing content current, dynamic and refreshed. Off-the-shelf and customised.
Broad and easy access to information	Anyone, anytime, anywhere, any subject. Multiple technology-based delivery methods. Synchronous and asynchronous. Enabling just-in-time training.
Engaging user experience	Rich multimedia experience. Realistic simulations and role playing. Video-based reaching and storytelling. Advice and explanations from experts/mentors. Animated case studies and examples. Interactive games, activities and music
Regular reinforcement	Personalised and/or real-time online mentors. Web-casts, interview, live events. Practical exercises and application. Facilitated workshops and discussion groups. Desktop advice, special events and updated learning opportunities, weekly newsletters and relevant articles.

Collaborative online communities	Access to fellow learners, educators, business leaders and experts. Access to system knowledge base. Private company and global communities
Centralised tracking and administration.	Easy and automatic knowledge management. Tools to evaluate progress of individuals or groups. Assessment metrics to pinpoint employee needs and goals. Measuring return on investment
Scalable technology.	Leveraging existing open industry standards. Scalable to any size enterprise. Flexible technology to include groups of workstations or the entire organisation. Easy integration with client's internal systems. Delivering media-rich broadband experience
Organisational consulting, implementation and integration.	Integration with existing curriculum and training delivery system. HR and IT administration training. Employee incentive and accreditation programmes. Performance reviews. Cultural support for self-study. Customised management training support. Behavioural change measurement and reporting.

4.11.3 The third tier: Strategising for educational efficiency

By now the educator must realise that delivering a course online is not as simple as merely placing all the information on e-learning and leaving the learner to read it all. Besides people management and technological strategies there are still pedagogical efficiency to address. A strategy for educational efficiency should be planned and only

then can one proceed with implementing the e-learning event (Stone & Bishop, 1997:3–5; Trenton & Scimeca, 1999:147).

The following factors specifically should be planned for:

4.11.3.1 Defining the participants

Technology will never replace educators or designers of instruction. It actually increases the number of roleplayers when it is used as a tool for delivering distance education. More demands are thus made on collaborative teamwork to ensure efficiency of delivery. The roleplayers and their duties are:

- The Instructional Designer is responsible for the initial analysis and design of instruction, as well as advice on exercises and revision.
- The writing of course material, exercises and auxiliary material, the developing of overheads and the support of the educator is the responsibility of the Instructional Developer.
- The Technology Supporter chooses the appropriate technology, install and maintain the technology, teaches the educators how to use the technology, coordinate with the facilities supporter (see next roleplayer)and coordinates with distant-site facilitator (see second last roleplayer).
- The Facilities Supporter works with the technology supporter in the setting up of distant sites.
- The Educator helps with course development by familiarising him with the course flow and the use of the technology, and he trains the learners.
- The production of training material (manuals, overheads, graphics, etcetera) is done by the Material Supporter.
- The Distant-site Facilitator coordinates all distant site set-ups, make sure the technology works and welcomes learners. He is available for the first 15 minutes of class to ensure technology works. He may assist educators with exercises and distributes pre-work, collects materials from learners and administers tests.
- The Management sponsor sponsors a distance learning pilot, removes organisational barriers, and market and promotes the projects to other managers (Abernathy *et al.*, 1998:30–31).

4.11.3.2 Definition of the aim, objective and structure of the course

Decide what the ultimate purpose of the e-learning event will be: To save cost or to provide a better means of learning? The aim to save cost should never weigh heavier than the educational aims. If so, the programme will once again fail due to learner dissatisfaction with cost-cutting designs.

The course outcomes must be determined. Thereafter activities should be arranged to gauge the achievement of the outcome. Specific content is selected and structured in modules. In order to ensure effective assessment and evaluation of the learner as well as the course, it is very important that the objectives of the training programme be clearly established. In other words, what must the learner be capable of doing after completion of the programme and how will one know he has reached an acceptable level of competence (Trenton & Scimeca 1999:147)?

A decision must be made on the method of dispersing the curriculum content. One can break it down into smaller objectives and only concentrate on that, or one can deploy all the content. One can also decide to concentrate only on capabilities or skills training, leaving the learner to do his own literature review (Anon, 2000:18; Abernathy *et al.*, 2000:20).

4.11.3.3 Definition of prerequisites

This phase entails doing a survey on course attendees to determine the level of basic knowledge that they have in order to manage the new course successfully (Trenton & Scimeca, 1999:147).

Link the e-learning to the overall business goals. If learning should take place during working hours make sure that permission for learning is given. Partnerships should be established between educational business units and the employer in order to obtain official time for learning.

Register all users to obtain commitment. Some learners lack the self-discipline to start. Registering them helps them acknowledge their own responsibility and act on it by commencing the learning process.

Consider methods that will be used to reward good progress. Learning online is a series of private successes, but people need acknowledgement of this success in some or other form (Galagan, 2000:29–30; Conè, 2000:62–62; Hipwell, 2000:18).

Prepare existing systems and processes for change, namely:

- The change in registration procedures and scheduling;
- the maintenance team to ensure the site stays up to date with new technological developments;
- prepare the training staff for the new approach. When a profession finds that there will be an inevitable drastic change in the way they used to do things they will resist. They need to be prepared to change their mindsets positively towards the change and to give them the technical skills required for managing their own training (Galagan, 2000:29–30; Conè, 2000:62–62; Hipwell, 2000:18);
- decide on whether to use supporting manuals and see to it that it is ready before start up (Hartley, 2000:40); and
- establish a privacy policy to ensure confidentiality (Abernathy *et al.*, 1999:16).

4.11.3.4 Content and design: determining scope and creative treatment.

During this phase the educator works with the instructional designer to decide what is to be taught and how to teach it. A design blueprint sets out the way in which the course will be presented, i.e. planning the instructional, presentational and navigational strategies, detailing the possible pathways through the course. This phase also includes a technological section, in the sense that decisions should be made on what hardware and software delivery systems should be used (Stone & Bishop, 1997:3-5; Trenton & Scimeca, 1999:146).

4.11.3.5 Course structure and timetable

The course architecture is set up through deciding what the educator wants to teach, and in what sequence it should be taught. The latter includes setting up a hierarchy of learning objectives. Material is divided into specific knowledge domains, which are then subdivided into macro-topics or modules of knowledge.

Online courses have stages and modules that coincide with the structure and content of the course. The stages in the course have a set timetable from which the learner may not deviate. The starting time on the modules is less explicit and their duration is more flexible. Stages follow each other sequentially and modules can be completed parallel to each other (Trenton & Scimeca, 1999:148).

When planning the course architecture, the following elements must be considered and planned for:

- **Course activities**

  Learning activities are specifically directed towards and managed around specific modules in order to align communication of all learners. A choice should be made on which activity or activities will suit the educational strategy best. A methodology must be identified for each of these activities, e.g. discussions, collaborative work, exercises, projects, etcetera The resources as well as the organisation needed for each activity must be carefully planned in order to predict the amount of time to be allocated to each phase of the course (Trenton & Scimeca 1999:148).

- **Flexibility**

  Online education courses must cater for the individual needs of the learner. A main learning path to achieve the learning goal should be built in. Provision should also be made for alternative learning paths, allowing the learner more time on a topic if needed (Trenton & Scimeca, 1999:148).

- **The size of the virtual group**

  The size of the group has a direct influence on the efficacy of the distance education. The size will determine specific educational strategies to be followed. The size also influences the type of interaction to be chosen for the course (Trenton & Scimeca, 1999:148).

- **Interaction typology**

  Decide on the level of interactivity needed. Will one use just basic interactivity, i.e. enabling the learner to communicate with the educator via e-mail, or will one use the best one can get, namely two-way video conferencing facilities (Barron, 1999:30)?

  Interaction between learners can be organised so that all remote learners interact with each other as a group, or so that subgroups are created which interact with other subgroups (Trenton & Scimeca, 1999:148). Communication plays a central role in traditional learning as well as in computer learning environments. The communication flow should be identified, as well as which roleplayers will be involved in creating the communication flow. Educators, learners, field experts

and technologist are all participants of the communication flow during online training.

Besides the flow of communication, decisions should be made on how to organise the virtual spaces in which the various conferencing communication will take place. Discussions, collaborative work and exercises posted on the Internet cannot happen in the same virtual space.

The most appropriate network service should be chosen to provide the needed communication structure, e.g. a conference can be conducted using either a listserver with e-mail or computer conference facilities. The cost implications of the latter are higher and it requires greater resources (Trenton & Scimeca, 1999:149).

Direct interaction between the learner and the educator is generally considered a prerequisite for successful learning to take place. Inman, Kerwin and Mayes (1999) found that this was not necessarily the case. In a study which attempted to determine the satisfaction levels of both learners and educators with distance education, it was found that direct interaction, which is generally considered a critical factor in traditional classroom instruction, played no roll in determining the learner's levels of satisfaction. However, it did cause initial negative attitudes from the educator's side. This may be due to the adaptation the educators have to make in their teaching roll, moving from traditional to distance education (Inman *et al*,. 1999:589 -590).

- **Practical ways of working online**

A specific suggestion should be made to learners with regard to managing their time, technical problems, place of work and study (Trenton & Scimeca, 1999:148).

- **Identification of resources**

Three kinds of resources exist, namely human, technological and material (media, printed, etc). Careful planning will assure using the right resources at the right time (Trenton & Scimeca, 1999:148).

Besides the mentioned resources, extra attention should be given to learners' writing skills and language skills, which act as an individual's own resources. This is especially valuable if the learner is studying in his second or third language (De Villiers, 2001:15).

The architecture of the course is crucial in accommodating individual learner needs. If it is well designed, it is unlikely to cause any frustrations as learners have many resources and options to address various needs at different stages of their learning paths.

4.11.4 Assessment and evaluation criteria

Planning the type of assessment to suit the pedagogical objectives is an essential part of determining the course design. Evaluation of online courses is normally built around the following functionalities: message analysis during conferencing, analysis of contributions (projects, etcetera), analysis of the frequency and the quality of participation to computer conferencing, evaluation of the learners' own progress reports and questionnaires at the end of the course (Trenton & Scimeca, 1999:148). Besides course analysis, evaluating customer satisfaction using the e-learning event is also important.

4.11.4.1 Evaluating customer satisfaction

Reeves (1997) reasoned that development efforts for the systematic evaluation of computer-based education lag behind developments because:

- consumers accepted that advertising a computer-based education product as effective automatically meant that it was effective:
- the efficiency of computer-based education was often measured quantitatively. The amount of money spent, learners reached and time availability to learners were used to determine the efficiency of computer-based education;
- evaluations already done were not presented in a user friendly manner and caused under-utilisation of existing studies to determine the efficiency of computer-based education. Understanding social science research reports is not a skill practised by the large part of the community using the particular computer-based education programmes;
- evaluators using empirical approaches to compare different computer-based education programmes made the mistake of assuming that the different treatments used in the programmes are cohesive, holistic entities with meaningful differences, i.e. comparing interactive multimedia versus classroom instruction (Reeves, 1997).

Reeves (1997) solved this problem by using pedagogical dimensions from which he developed fourteen evaluation criteria, based on existing learning theories, that must be used to evaluate e-learning. These dimensions focus on the aspects of the design and implementation of computer-based education that affect learning. They refer to the ability of computer-based education to "..initiate powerful instructional interactions, monitor learner progress, empower effective educators, accommodate individual differences, or promote cooperative learning." (Reeves, 1997).

Because these dimensions are so important in bringing the pedagogical focus back into the e-learning event, an explanation of each as Reeves (1997) sees it will be given. The fourteen dimensions described by Reeves (1997) are:

- **Epistemology**

  Epistemology is concerned with the nature of knowledge. The nature of knowledge can be illustrated by a continuum with objectivism and constructivism forming the outer limits of the continuum.

  Epistemology continuum

  Objectivism ⟷ Constructivism

  In education one can find educational programmes in varying places on the continuum between pure objectivism and pure constructivism. There is a constant tension between the two and theorists disagree on when the one or the other is more or less appropriate. As example of these different approaches, one can say that the subject Science is an exact subject and the laws are immutable. The educational approach should therefore be objectivist. Objectivists will reflect the knowledge as structured upon the advice of the most widely accepted experts in a particular field. The Constructivists, however, will reason that there is a multiplicity of perspectives and will allow the learner the opportunity to rediscover the theories but will also provide rival theories as possible replacements of the currently accepted norm (Reeves, 1997).

  The Constructivist epistemology has already been discussed in Chapter 3 and extensive motivation has been given why it is the epistemology of choice for e-learning events in the workplace.

  To summarise the basic difference again, see table 4.2.

Table 4.2. A comparison of the basic principles of Objectivism versus Constructivism

Objectivism	Constructivism
Knowledge exists on its own without beings being aware of it.	Knowledge only exists inside the minds of beings.
Reality exists without the existence of a conscious being. The world is complete with all the entities, structures and properties already in it.	Reality does exist independently, but is individually constructed by each individual.
Knowledge is gained objectively through sensing.	Knowledge is constructed through a process of metacognition. The latter process connects new information to former experiences, select thinking strategies and plan, monitor and evaluate thinking processes.
Learning is represented by gathering the truth.	Learning consists of acquiring viable doctrines or theories that meet one's objectives.
Tests can precisely measure the amount of learning that has taken place.	Learning cannot be measured. It can only be estimated through dialogue and observation.

(Reeves, 1997; Duffy & Jonassen, 1992:2 - 3).

- **The pedagogical philosophy**

Philosophy continuum

Instructivist ⟷ Constructivist

The Instructivist and Constructivist pedagogical philosophies as illustrated above can also be used to separate different computer instructional methodologies.

The Instructivist approach uses methodology where goals and objectives have been clearly defined from an existing pre-specified pool of knowledge. From this domain of knowledge, goals and objectives are chosen and a hierarchy of learning

from lower to more intricate learning is built. The learner is seen as a passive vessel to be filled with knowledge.

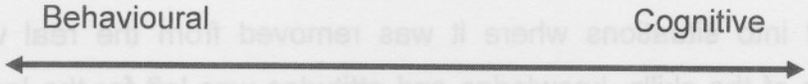
The Constructivist sees the learner as a complete individual with his own mental models, schemata, metacognition, experience and intentions. Learners come to cognitive equilibrium by reconstructing their own truths based on prior knowledge. Constructivists' instructional methods focus on discovering the learning styles, motivations and capabilities of learners. The learning environment must be as rich as possible (Reeves, 1997; Resnick, 1989:5).

Traditional drill and practice programmes are an example of an Instructivist approach, whilst mind tools can be seen as a Constructivist approach. Mind tools are computer applications that enhance critical thinking when the learner engages in a learning programme. It does not "store" existing knowledge to be accessed and read by the learner. It engages the learner in thinking about a concept from various perspectives. Using databases is an example of a mind tool (Reeves, 1997; Jonassen *et al.*, 1998:24).

The pedagogical approach chosen by an institution is usually influenced by the religious and political beliefs of the community leaders, parents and/or employees of the particular organisation (Reeves, 1997).

- **The Psychological approach underpinning the programme**

Psychological continuum



Programmes can vary between purely behavioural approaches, i.e. a stimulus and response approach, or a cognitive approach, where it is required of the learner to use higher order thinking as part of the learning process. The latter approach uses learning strategies that include memorisation, instruction, drill and practice, mind tools, and inductive and deductive training methods (Reeves, 1997). Cognitive strategies that can be used include learning to learn, and strategies to remember and to solve problems. Cognitive theories stress that learning does not occur by transference of information but by interpretation of information. Besides providing new information, instruction must also provide stimulation for active knowledge construction processes. The latter will improve ability to reason and interpret

information (Cagné, 1987:666–667; Kyllonen & Shute, 1989:129; Resnick, 1989:1-2).

- **Goal orientation as evaluating dimension**

Goal orientation

Focused ⟷ No Focus

Depending on the extent to which knowledge has already undergone extensive negotiation, it can be either sharply focused (thoroughly negotiated) to unfocused (open to many interpretations). Deductive learning can easily be done with sharply focused direct instruction, whilst inductive learning requires a more unfocused approach, i.e. using virtual reality simulations to teach medical examinations (Reeves, 1997).

- **Experiential validity**

Experiential value

Abstract (not contextualised) ⟷ Concrete (contextualised)

Originally training was provided through a process of shadowing the educator in his job. This type of apprenticeship taught the learner the necessary skills, knowledge and attitude needed for the job. It was only later that teaching developed into situations where it was removed from the real world and the application of the skills, knowledge and attitudes was left for the learner to do on his own. This decontextualisation – taking the learner out of the real situation – causes a decrease in transfer of knowledge. To overcome this discrepancy computer-based education must be contextualised and anchored in or focused on specific job-related problems and challenges. This will assist in creating useful knowledge and not inert knowledge (Reeves, 1997; Duffy & Jonassen, 1992:4).

The benefit of anchoring instruction is allowing the learner to experience the changes that his perceptions undergo in the process. He experiences the realisation that initial views were not as effective as later more fruitful perspectives that developed after exposure to the anchor. The goal of anchored instruction is "...to enable learners to notice critical features of problem situations and to

experience the changes in their perception and understanding of the anchor as they view the situation from new points of view."(Bransford *et al.*,1990:123 + 138).

- **The role of the educator**

Educator's role

Didactic (telling) ⟷ Facilitating (discovering)

Teaching can be done by either by telling or "transmitting" knowledge or by allowing the learner the opportunity to discover knowledge through facilitation by the educator. The educator can use computer-based education to assist his telling style of teaching or he can stand aside and facilitate the learning process through computer-based education. In the latter instance he can also end up being taught. One should watch out for situations where the educator is so busy keeping the computer-based education going that neither one of the two roles is any longer present (Reeves, 1997).

- **Programme flexibility**

Flexibility

No modification ⟷ Modification allowed

There are two different views on the amount of flexibility that a computer-based education programme should allow. The one allows no interference for fear of losing the fidelity of the programme whilst others insist on the need for modifications to adapt the programme to their specific needs. Reeves (1997) advises that a fine line be walked between the two approaches when designing computer-based education so as to avoid the negative effects of both. The programme should not lose fidelity yet it should also allow adaptation according to specific needs (Reeves, 1997).

- **The value of errors**

Value of errors

Errorless ⟷ Trial and error

Some educational theorists believe that true education should be errorless. Computer-based education based on this assumption is thus designed to ignore incorrect entries and continuously give more supportive instructions. Other theorist prefer experiencing the true situation and allowing for mistakes as a way of learning in order for it to be more effective. There are learning situations in which no room for error should be allowed since it can cause harm. However, learning through errors can also be very effective. Some programmes never allow correct answers, constantly prompting the learner to look at new solutions and teaching them that sometimes there are no perfect answers (Reeves, 1997).

- **Motivation as pedagogical dimension for evaluating computer-based education**

Motivation to learn will stay an important driving force for al learners and should be designed into any computer-based education programme. Motivation can be divided into extrinsic and intrinsic motivators. Extrinsic motivators are the extent to which learners need the knowledge for external rewards i.e. promotion. Intrinsic motivation refers to the internal meaningful context material to be learned. Just giving it meaning, however, does not ensure that learners will be motivated.

Intrinsically motivating instruction is an illusive concept as it has been proven that many learners are not motivated by interactive multimedia but ratehr by their own need to confirm what they already know. There is no guarantee that learners will utilise all possibilities when using an interactive multimedia programme. When they do, it is not for the sake of the interactivity but rather to confirm existing knowledge. Owing to this fact, extrinsic motivation will remain a critical factor in all learning (Reeves, 1997).

Motivation

Extrinsic ⟷ Intrinsic

- **Providing for individual differences**

The effectiveness of any course depends to a great extent on how provisions has been made for the individual differences amongst the learners. No group is homogenous in aptitudes, prior knowledge, motivation, skills, etcetera It has been proven that computer-based education programmes that accommodate individual differences have better learning outcomes.

Providing for individual differences

No accommodation — Multifaceted

(Reeves, 1997).

- **The extent of learner control**

Learner control

Programme controlled — Unrestricted

Computer-based education programmes often allow the learner to choose which path to follow through the material. This allows for individualisation and a more effective learning event. It is also a fact that learners perform better when no control is allowed when they use computer-based education. Many studies have led to a *no significant difference* result (Russell, 2006). It is the researcher's opinion that some control should be left to the learner to decide whether he wishes to use it or not (Reeves, 1997).

- **Learner activity**

Activity

Static (Mathemagenic) — Creative (generative)

Depending on whether the computer-based education allows the learner only to access representations of material or to create new material, it can be classified as either mathemagenic or generative. Although combinations of both can be used in any computer-based education programme, the research approach supported by this thesis is the generative approach. The Mathemagenic approach relates close to the Instructivist theory, whilst the generative approach is related to the Constructivist theory (Reeves, 1997).

- **The value of cooperative learning**

  Cooperative learning

  Collaboration — No collaboration

  It is a well known fact that learning is more effective once the learner gets the opportunity to negotiate and talk about the content. The value of cooperation in groups or on an individual basis can be either socially or instructionally beneficial to the learner (Reeves, 1997). The social benefits of cooperative learning are related to attitudes of acceptance, respect, trust and liking amongst learners (Johnson & Johnson, 1991:36).

- **Sensitivity to cultural differences**

  Cultural sensitivity

  Not sensitive — Integral sensitivity

  Knowledge of the particular target group's culture is essential when choosing a particular computer-based education programme. Computer-based education designs can be offensive or ineffective if they do not accommodate cultural habits and beliefs (Reeves, 1997).

To summarise, Reeves (1997) states that these fourteen pedagogical dimensions need to undergo validation before the reliability of his evaluation model can be proven. It also needs to be used by experienced computer-based education users. Clear quantitative validation as well as qualitative validation must be done to prove effectiveness. The researcher is of the opinion that this model is promising but that the first two dimensions, epistemology and pedagogical psychology, can be combined with learner activity since they basically talk about the same concepts. Furthermore, this model is rather an instrument to position a computer-based education event in terms of where it lies on the various continuums. After defining the positions in terms of the fourteen dimensions one can decide whether the model will work for the particular target group as well as the particular subject matter. Another shortcoming of this model is that it

focuses only on Pedagogical issues, whilst other technological or people issues can still cause an e-learning event to fail.

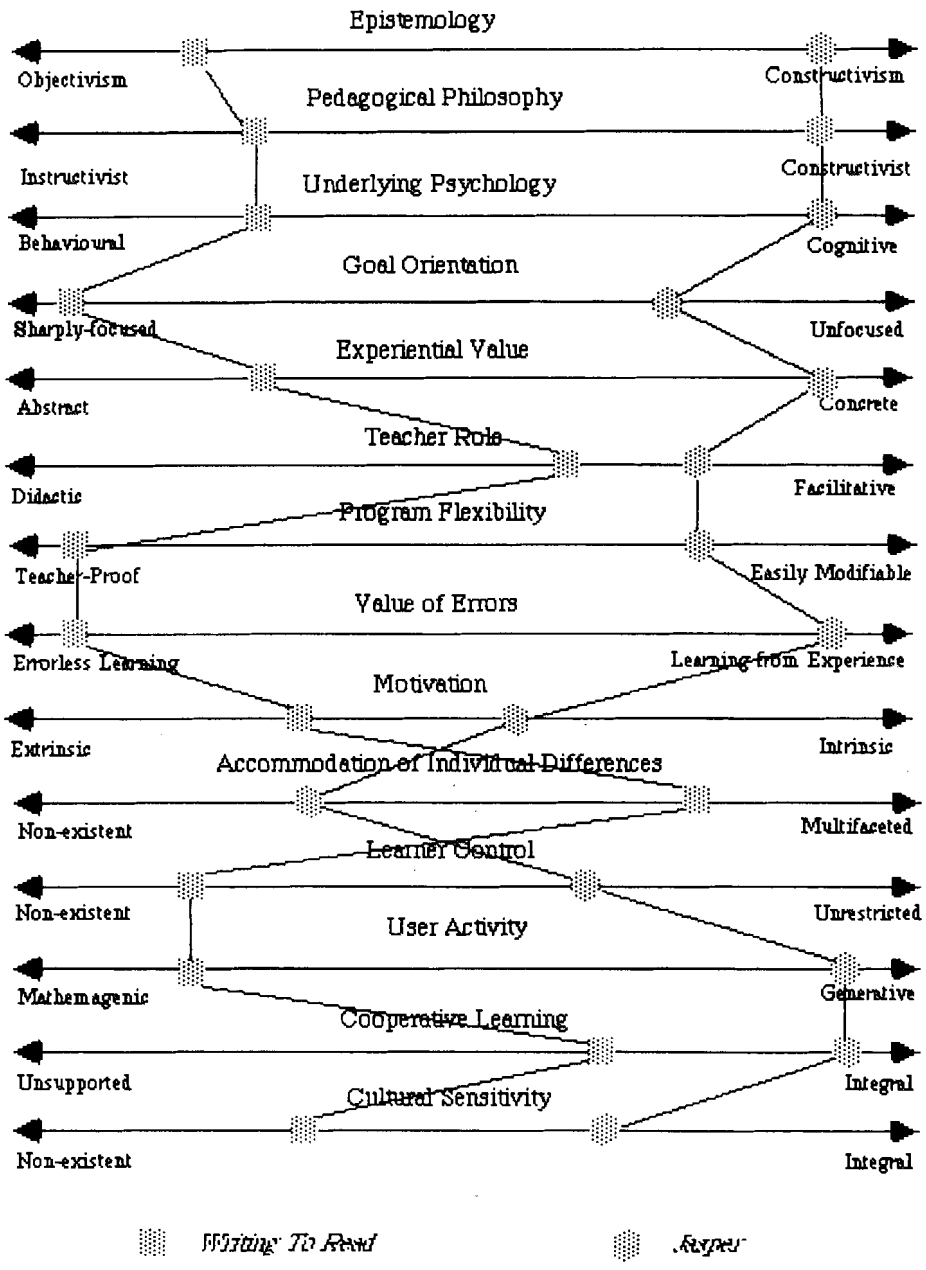
Figure 4.3 is an example of Reeves's model for evaluation of computer-based education based on the programmes "Writing to read" and "Jasper". It illustrates how one can plot a programme in terms of the model. This can assist in determining whether the pedagogical element of a programme complies with accepted requirements.

4.12 CRONJE'S (2002) RESEARCH SUPPORTS A THREE-TIERED APPROACH

In a study done by Cronje (2002), he highlights what he has learned from his research project on a group of learners, and this confirms the importance of ensuring that a three-tiered approach needs to be followed to ensure an efficient learning experience. Concerning the preparation of the people concerned, his research pointed out that learners must be competent with the basics of using their own mailers and browsers. He highlights the changed roll of the educator who also learns through the process of using the Internet as delivery tool.

The importance of technological preparation was confirmed in his findings that the remote as well as the home network must be stable. The web works well for storing large quantities of information. Online discussion facilitates learning very well. If either of the networks is going off line for a period, the learners should be notified well in advance of the event. The success of the project lied in the flexibility of the design of the programme.

Figure 4.3 Pedagogical dimensions of the "Writing to read" and "Jasper" programmes (Reeves, 1997).



Planning for educational value was confirmed by this research in that it showed that progress should be monitored through the setting of deadlines for tasks beforehand. Creating communication opportunities enhanced cooperative learning and in this way added value to the learning experience of the learner. Furthermore, allowing learners to determine the scope of their projects themselves worked well, but he found that it should be opened for comments from their peers in order to prevent overestimation of

what can be done in a fixed time period. Learners could do more or less what they wanted, provided they used the tools which they also had to learn to use (Cronje, 2002).

4.13 E-LEARNING IN THE FUTURE

There will be revolutionary changes in the next few years in the development of e-learning. The Internet redefines e-learning in terms of better delivery of the most current, relevant, personalised, dynamic learning experiences. Collaboration with peers and experts through the development of technology to mimic the real classroom situation will improve.

The Internet has penetrated most of the sectors of the economic industry but has been slow to transform the educational industry. It is expected that this will change drastically in the near future, with educational institutions using the Internet as educational tool on a wide scale (McCrea *et al*,. 2000:8).

The researcher is of the opinion that the overall advantages of e-learning weigh much heavier than classroom training, and with the added expectation that lifelong learning is essential to stay competitive in today's world, e-learning is here to stay. This is especially true for using this form of training in the workplace. It also opens up the ideal opportunity for poorer learners, as well as for learners who are geographically dis-advantaged and who cannot afford campus residence costs to develop their skills further.

Perhaps the problem of the educator having to choose between e-learning and classroom learning can be solved by combining the two delivery systems so as to create a positive synergistic effect. The latter is already being implemented in various institutions all over the world. Various educators follow what is called a blended approach so as to get the most out of the learning event. The role that e-learning and classroom training will play in this solution may vary from time to time as technology steams ahead with new inventions every day.

It is possible that e-learning will overshadow classroom training with the continuous development of new methods to mimic the real classroom. It is also possible that classroom training may overshadow e-learning if in the long run it is discovered that there are unforeseen negative effects on normal human development, like socialisation, for instance.

It is important to do more research on the educational value that technological delivery systems add to distance education and not to focus on technology as the ultimate solution to ensure good education. The use of technology to deliver education is only a tool. If not used appropriately it will cause failure of the learning process no matter what delivery system is used.

In order to explore how educational value can be added to distance education delivery systems the researcher will test core concepts related to the topic in the next chapter. Learning theory and the characteristics of distance education and accepted e-learning pedagogical practices are built into a readiness model so as to ensure a positive learning experience.

4.14 CONCLUSION

In this chapter the phases of implementing e-learning have been described. Vocational trainers first need to make a decision if e-learning is the best tool of choice for their pedagogical strategy. Once this decision has been made they have to decide which technological delivery systems are available to them and how they can use the system to suit the course objectives. Then followed a discussion of the implementation of e-learning events that adhere to a three-tiered strategy considering people, technological design and pedagogical efficiency issues.

The previous three chapters provided the foundation for the actual research, which will be described in the next chapter. The researcher will apply the requirements as described in the previous chapters by compiling a model with which to determine the readiness of a workplace for an e-learning event. The validation as well as testing of the model in a real workplace will be described and the results reported.

CHAPTER 5

METHOD OF RESEARCH

5.1 INTRODUCTION

In previous chapters the requirements when using distance training were explored. The epistemological philosophy of Constructivism as it applies to the Information Age was discussed. In Chapter 4 electronic learning, its choice as tool for delivery or not and the various phases of implementation and how they depend on each other were discussed.

In Chapter 5 the method of research will be discussed, along with the research design as set out in Chapter 1. The purpose will be discussed, after which the design will be mapped out visually in phases. Each phase in the research will be discussed with regard to the target group (population), method used, instruments used and results of the research phase discussed by presenting the relevant statistical analysis techniques used.

5.2 PURPOSE OF THE STUDY

The purpose of the study is to find an answer to the research question, namely:

> ***How is a quality distance training event for the various employees and the employer in their different settings to be ensured.***

To ensure a quality distance training event one needs to know what criteria must be complied with to meet the requirements of distance training. This involves taking a holistic view of all factors that may influence the training event.

The study aims at developing an electronic readiness model for distance training in the workplace. This model sets out the various dimensions (in holistic fashion) to be considered when planning for and presenting an e-learning event. By using the model as tool for guidance before, during or after an e-learning event, the workplace can ensure a successful event, diagnose problem areas in an existing event or remedy future events by looking at already completed but unsuccessful e-learning events, so as to avoid similar problems in future training.

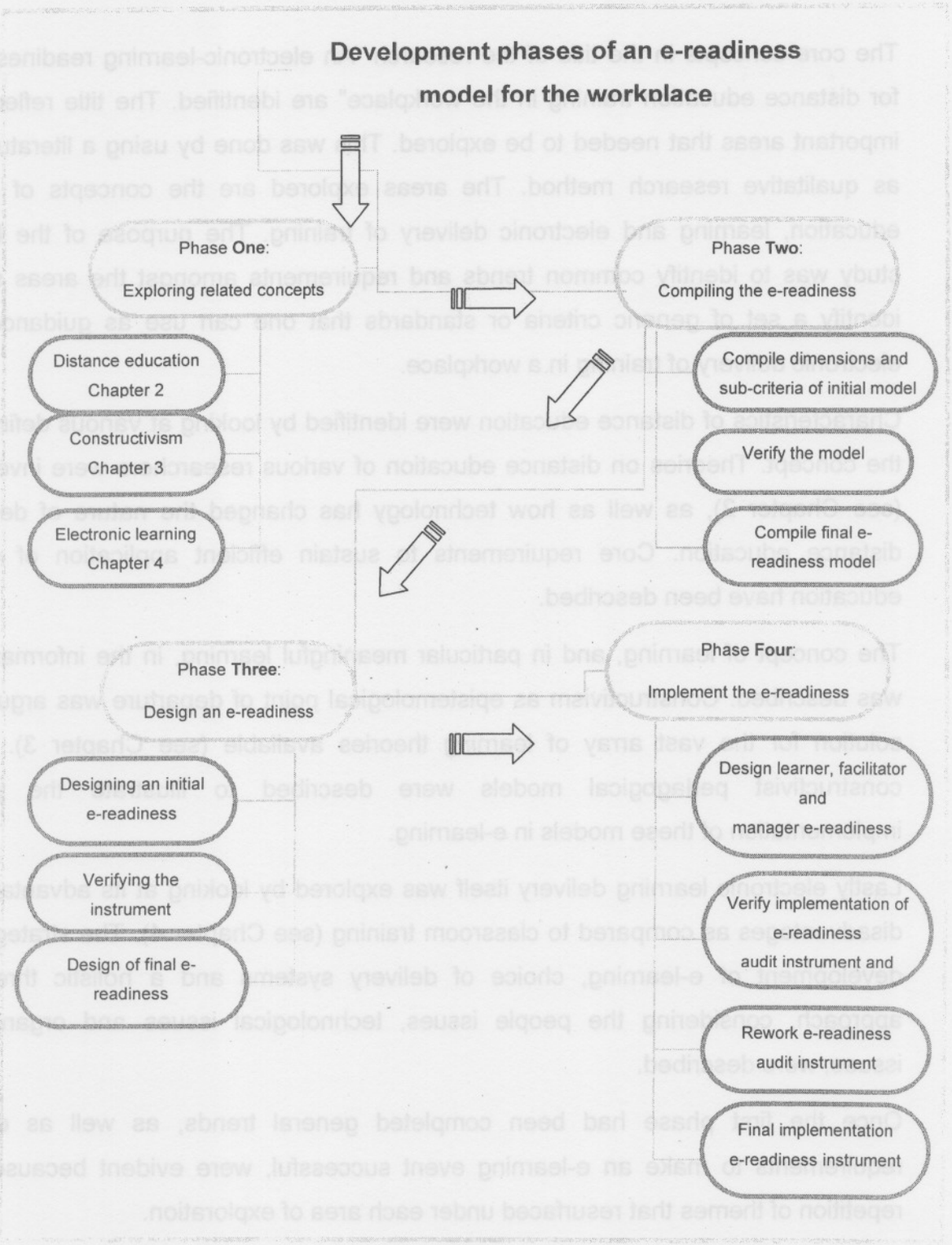
In the process of developing the model, the identified needs (refer Chapter 1) have to be met, namely to develop an e-readiness model that is:

- user-friendly to the average workplace trainer and/or manager with little or no experience of e-learning by providing guidance incorporating sufficient information to assist with decision-making processes, namely that it must be inclusive of:
  - a specific training epistemology for the information age;
  - adult learning techniques;
  - requirements to be met when applying distance education; and
  - tools (measuring instruments) that can be used to collect the necessary evidence in order to determine the readiness for e-learning;
- user friendly toward the workplace as a business, considering the overall culture as well as the specific smaller cultural groups that may exist within the various subunits of the bigger organisation by:
  - designing it so that it can be used at different stages of an e-learning event – before, during or after;
  - involving the most important stakeholders of the e-learning event – the learner, the facilitator and the manager of the e-learning event; and
  - focusing on a training philosophy as central point of departure to prevent other organisational needs, e.g. cost issues, which override quality training issues, that may cause the event to be watered down and fail.

5.3 THE DESIGN OF THE RESEARCH

The process of developing and testing the e-readiness model went through four main phases. An illustration of the phases and the substages under each is demonstrated in Figure 5.1

Figure 5.1. The research process followed in the development of an e-readiness model for the workplace



5.3.1 Phase one: Exploring the research title by doing a literature study

The core concepts in the title of the research "An electronic-learning readiness model for distance education training in the workplace" are identified. The title reflects three important areas that needed to be explored. This was done by using a literature study as qualitative research method. The areas explored are the concepts of distance education, learning and electronic delivery of training. The purpose of the literature study was to identify common trends and requirements amongst the areas so as to identify a set of generic criteria or standards that one can use as guidance during electronic delivery of training in a workplace.

Characteristics of distance education were identified by looking at various definitions of the concept. Theories on distance education of various researchers were investigated (see Chapter 2), as well as how technology has changed the nature of delivery of distance education. Core requirements to sustain efficient application of distance education have been described.

The concept of learning, and in particular meaningful learning, in the information age was described. Constructivism as epistemological point of departure was argued as a solution for the vast array of learning theories available (see Chapter 3). Various constructivist pedagogical models were described to illustrate the practical implementation of these models in e-learning.

Lastly electronic learning delivery itself was explored by looking at its advantages and disadvantages as compared to classroom training (see Chapter 4). The strategy in the development of e-learning, choice of delivery systems and a holistic three-tiered approach, considering the people issues, technological issues and organisational issues, were described.

Once the first phase had been completed general trends, as well as essential requirements to make an e-learning event successful, were evident because of the repetition of themes that resurfaced under each area of exploration.

5.3.2 Phase two: Compilation of the e-readiness model

5.3.2.1 Compiling an e-readiness model

The second phase of the research followed a qualitative as well as a quantitative research approach.

Through following qualitative methods of synthesis and analysis, using Microsoft Excel, a data-gathering tool, a database of common trends and/or requirements as identified from the literature study was listed as standards or criteria to plan for or to be complied with to ensure a successful e-learning event. The criteria, of which there were 156 at first, were color-coded and common themes grouped together. Each criterion was allocated to a particular dimension, whether it mostly belonged to the *human resources, pedagogical, technological or organisational dimension*. Each criterion was further analysed by deciding to whom it mostly applied, and who would be the owner or accountable person for the standard. Various other questions, such as what evidence would be needed, to whom to ask the question and what to plan for, were included in the initial database as part of the analysis for further clarification at a later stage (phase three and four) of the research process. This process culminated in the establishment of an initial e-readiness criterion model.

The original database is very large and difficult to demonstrate in Word format in A4 format. For that reason a copy of the database has been added to this research in CD format as *Appendix A (Excel database)*. The database can be filtered and sorted using Microsoft Excel's filtering and sorting abilities, which make its use much easier. For instance, if one only wants to look at the human resource dimension's criteria, one only needs to choose this option on the drop-down menu under column I in the spreadsheet. This ability can be quite helpful during later stages to identify problem areas.

5.3.2.2 Verifying the e-readiness model

The initial model as compiled needed to be verified as complete and accurate before it could be accepted as valid and authentic, and applied for use in designing an e-readiness audit instrument and participant questionnaires. In order to confirm the existing criterion as correct and to exclude the possibility that there might be unidentified requirements or unnecessary requirements, the model had to be exposed to a group of people with existing experience in the use of e-learning in distance education for comments

5.3.2.2.1 Method of research

In this part of the study a constructivist research perspective was used by following an empirical approach. Only people with experience in e-learning were involved to assist in the construction of the e-readiness model (De Vos, 1998:247). A combined quantitative and qualitative research method was used to verify the criteria required for the e-readiness model. An online Internet research facility "QuestionPro" (QuestionPro Survey Software, 2005) was used to compile the questionnaire (*Appendix B – Pilot Questionnaire*).

The questionnaire design represented the four dimensions (Human Resources, Technological, Pedagogical and Organisational) with the necessary criteria under each. Each criterion was stated as a requirement to be complied with. The respondents had to choose whether they agree with the requirement or not. The respondents were required to indicate their preferences on statements made on a Likert scale with responses ranging from "strongly agree" to "strongly disagree".

A biographical division was added so that contact details could be obtained should the qualitative part of the research require further investigation, and to determine the respondents' relationship and experience with regard to e-learning. This was necessary to eliminate responses from respondents who may have no relationship or experience with regard to e-learning, as these respondents are not considered to be able to provide trustworthy opinions. It was also added to determine whether it has any significant influence on their particular choices as regards the criterion of the e-readiness model. The contact details requested by the questionnaire were optional to provide for individuals who chose to stay anonymous, yet did not prevent them from completing the rest of the questionnaire.

To accommodate the possibility that some criteria might have been omitted, a qualitative method was used by including an area on the questionnaire where the respondents could add requirements that they found in their own experience to be essential. A pilot study was conducted: minimal changes were made to the questionnaire and a second questionnaire (*Appendix C – Main study – slide show/open text reports and stats*) was used to conduct the main study in determining the validity and authenticity of the initial model.

5.3.2.2.2 Population used for Phase one of the Research

In order to comply with the concept of following a holistic approach as inherent requirement of the model, all stakeholders needed to be involved in the final compilation of the model, including learners, facilitators, managers and technical designers of e-learning. It was also important to make sure that participants have the necessary exposure to e-learning to provide for authenticity and reliability of the results.

For this reason a combination of panel and purposive sampling needed to be done from a group of experienced e-learning users (Columbia Centre for New Media Teaching and Learning, 2004; De Vos, 1998:198. Polit & Hungler, 1999:296–300). The total population of participants of an international instructional technology e-learning Internet community forum of the University of Georgia was chosen to execute the study (Instructional Technology Forum, 2005). From this group a smaller group responded, who is considered to be a representative sample of the community of stakeholders necessary for this research. The consent to execute the study by using their listserv was obtained from the manager of the listserv (listserv available from researcher on request). This listserv contained 1 992 known members as well as a limited number of unknown members who preferred not to have their names listed. The latter were not used but they could still respond as the questionnaire was also advertised in the standard e-mail going out to all members on a daily basis. An Internet link was provided on the forum letter which they could follow should they wish to participate. Known members were automatically contacted for participation through a facility in QuestionPro, which provided for all the e-mail addresses to be loaded on the site (Questionpro, 2005).

A smaller group of this listserv was used for the pilot study (list available on request). From this group consisting of 407 people, chosen through systematic sampling (every fifth person on the list was chosen), 48 responded (DeVos, 1998: 197). This whole group has been excluded from participating in the main study.

Known reachable population: 1585 persons.

A random sample was obtained through processing all responses after sending an invitation to all remaining participants.

5.3.2.2.3 Discussion of progress of research

The questionnaire invitations were sent out to all members of the Instructional Technology Forum (excluding the 407 pilot questionnaire participants), and a period of one month (May 2005) was allowed for completion of the questionnaire. Two reminders were sent out during this period. Progress was tracked and participation was closed after one month (Instructional Technology Forum, 2005).

Participation was satisfactory (see Table 5.1), as the accepted size of the target sample of at least 10 to 15% of the total population available, which was at least 158 responses, was exceeded and 20% (329) of the population responded by full completion of the questionnaire (De Vos, 1998:192–193).

Table 5.1 Target group statistics

Phase Two: Research participation statistics	Number	% of Total Population
Total reachable	1585	100
Survey views (Internet link opened)	715	45
Started but did not fully complete	512	32
Fully completed responses	*329*	*20*
Most answered per question	382	24
Least answered per question	296	18
Early dropouts (after starting)	183	11

5.3.2.2.4 Statistical analysis

To analyse the target group as well as their responses to the four dimensions of the e-readiness model questionnaire, *frequency distributions* and the *mean* as measure of central tendency were used. The mean is the most useful statistic in this instance to indicate the centre of gravity or balance point of choices made by respondents thus reflecting the importance of that particular criterion. This is especially important where the sizes of the various subgroups of the population differ (some are small compared to others) and relying on frequency alone is not very meaningful.

The mean was used to determine which criteria to keep as a part of the e-readiness model. Only criteria accepted as essential by more than 50% of the population were accepted. The 95% confidence interval indicating the true mean should the whole target group have participated has also been used to indicate the trustworthiness of results obtained from the sample. The standard deviation has also been reflected to indicate the measure of variance of all responses around the mean (De Vos, 1998:206–208 and 216–218; Steyn *et al.,* 2000:56–76 and 105, 129; Duncan *et al.,* 1977:2–5, 11–15 and 63–65; Adelheid & Pexman, 1999: 81–85, 95–100).

Cross tabulation using dichotomous variables (contingency tables) was used as a bivariate method of analysis. To determine whether there is any statistically significant relationship between the characteristics of the population (years experience, role in e-learning, context of use) and their choices, the chi-square and the P-values were calculated and the effect sizes were determined with the phi-coefficient (ø). For the relationship to be statistically significant the P-value must be below 0.05. The following guidelines were used to interpret effect size:

ø = 0.1 small effect

ø = 0.3 medium effect

ø = 0.5 large effect

Only when ø ≥0.5 can the effect be considered as practically significant (Connor-Linton, 2003; Ellis & Steyn, 2003: 51–53; Steyn, 1999:16; Steyn, 2002:10–15; Adelheid and Pexman, 1999:43–45).

Cross tabulation assisted in determining whether the different sections of the target group, the places where they work, years experience and role in e-learning had a significant effect on the choices they made, e.g. whether the years of e-learning experience have had a significant effect on the choice for branded e-learning material.

The reliability of the questionnaire, namely the probability that the questionnaire will obtain the same results in similar but separate situations for all four dimensions, are calculated by using the Cronbach coefficient alpha and are reflected in a graph (see Figure 5.3) (Oosthuizen, 1978: 28).

5.3.2.3 Statistical analysis and characteristics of the biographical information of the target group that participated in the e-readiness model questionnaire (SECTION A)

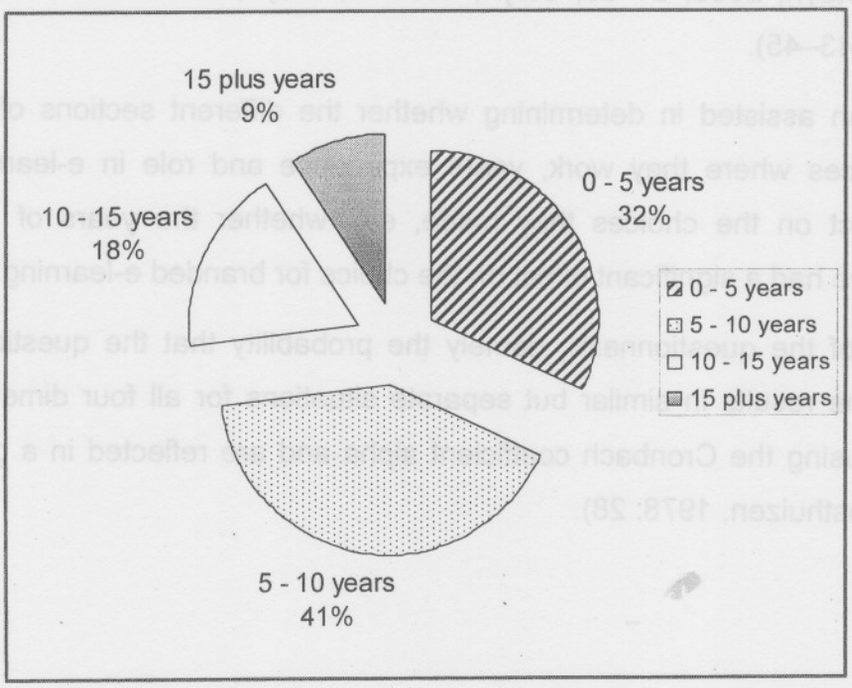
5.3.2.3.1 Years of experience in e-learning

Regarding the ***years of experience*** the participants had as regards e-learning (See Figure 5.1), most had more than five years of experience. The 120 respondents (32%) who had less than five years experience were also used as their input as "newcomers" was also considered important.

The following evidence allows for the assumption that all the participants were in some or other way involved in e-learning:

- the purposive sample of people who joined a forum for which registration is necessary, whom one can assume are specifically interested in instructional technology or else they would not have registered and allowed their e-mail to be listed; and
- the specific request in the introduction of the questionnaire, indicating, "Anyone who is involved in or has past experience of e-learning – either being a learner, manager, facilitator or any other relationship."

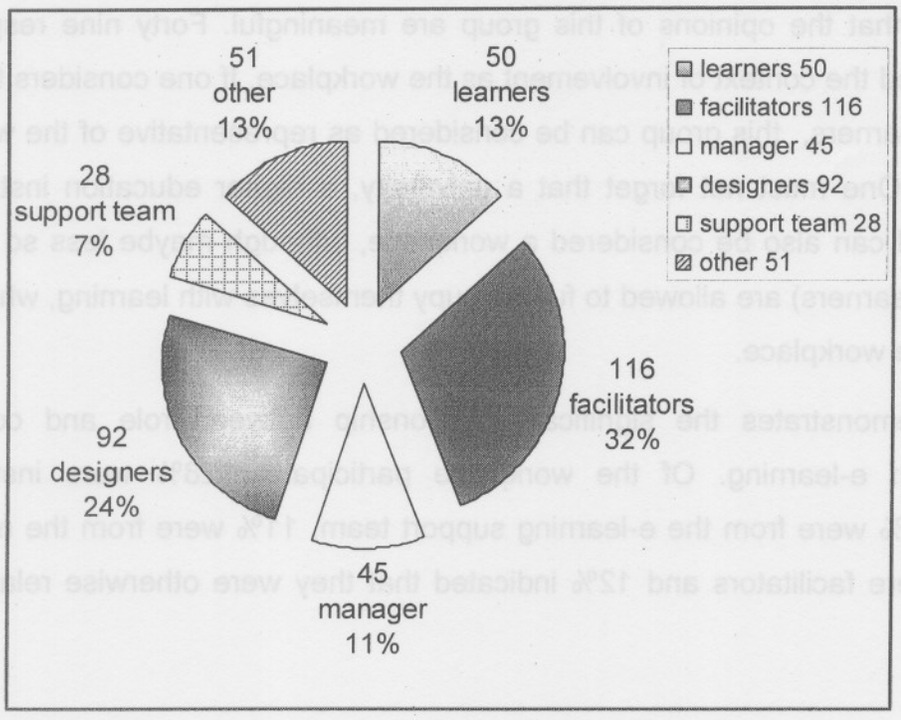
Figure 5.1 E-learning years of experience of participants



5.3.2.3.2 Relationship towards e-learning

All the participants were in some or other way involved in e-learning. From the 51 participants who did not indicate their relationship to e-learning as a learner, educator, manager or designer, only nine did not indicate their relationship as directly linked to e-learning. They were a writer, two librarians, three researchers, one consultant, one project manager and one evaluator (see the Open Text Report Appendix D). The rest all indicated that they are still involved with e-learning in more than one way besides the options provided. One can consider the relationship of all participants (see Figure 5.2) as meaningful and representative of all stakeholders necessary for this study. The e-learning facilitators and instructional designers who made up most of the group, namely 56%, are especially meaningful as one can assume they have hands-on day-to-day experience of e-learning events.

Figure 5.2 Participants' relationships to e-learning



5.3.2.3.3 Context of involvement with e-learning

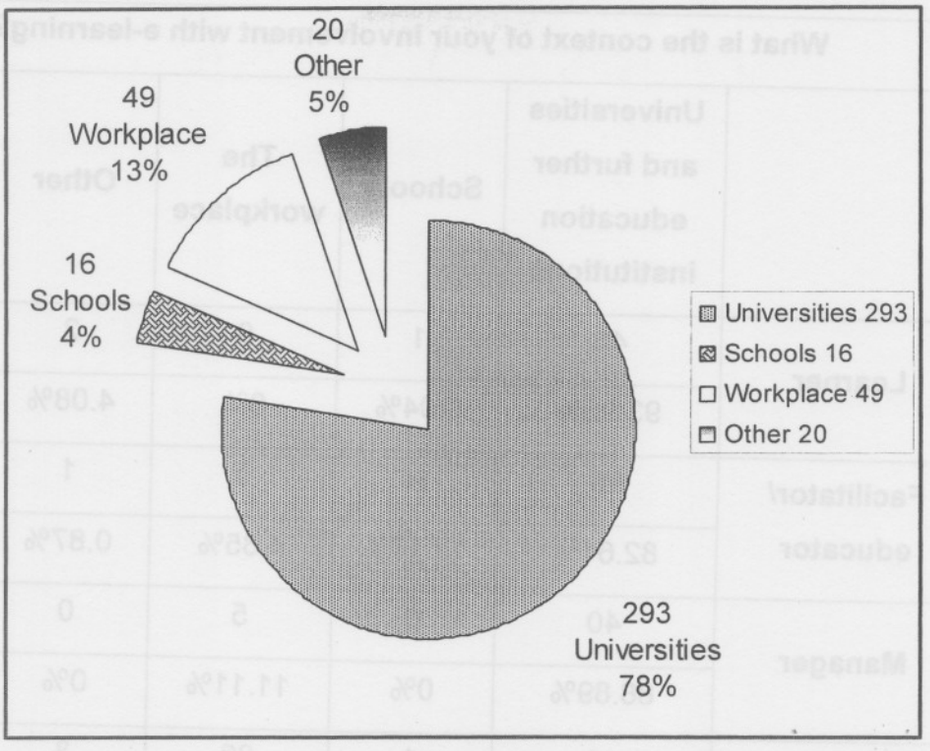
Regarding the ***context*** in which the participants are involved with e-learning, the participants had to indicate whether they are learners, facilitators, managers or linked to e-learning in another context (Figure 5.3). Only three persons did not indicate a clear link to e-learning. Except for these three, all the people that were not related to a university, workplace or school were in other ways involved with e-learning on a daily basis.

With statistical analysis the p-value (<0.001) indicates that the relationship between role and context of involvement in e-learning is significant. The size of the significance or effect indicated by ø is 0.56. This effect size indicates that the relationship and effect are of practical significance.

A significant percentage of the group (78%) indicated that they are in some or other way affiliated with a university, college or other further education institution. If one assumes that e-learning is most prevalent among groups who are involved in studying one can also assume that the opinions of this group are meaningful. Forty nine respondents (13%) indicated the context of involvement as the workplace. If one considers that none of them are learners, this group can be considered as representative of the workplace environment. One must not forget that a university, a higher education institution or even a school can also be considered a workplace, although maybe less so because the workers (learners) are allowed to fully occupy themselves with learning, which is not the case in the workplace.

Table 5.2 demonstrates the significant relationship between role and context of participants in e-learning. Of the workplace participants, 28% were instructional designers, 26% were from the e-learning support team, 11% were from the managers group, 4% were facilitators and 12% indicated that they were otherwise related to e-learning.

Figure 5.3 Context of participants' involvement with e-learning



All in all 94% of the total population were in some or other way directly involved with e-learning in a learning context, i.e. either a university, a school or the workplace. Whilst only 5% did not clearly indicate a significant e-learning role or context. Also significant is that most of the respondents, namely 87%, are not learners and can be considered to be more knowledgeable and experienced as regards e-learning, whilst 73% of the respondents were either facilitators, managers, instructional designers or part of a support team for e-learning.

The finding, indicating that the relationship between participants' roles and the context in which they are involved with e-learning is practically significant, gives more credibility to the results of this phase of the research.

Table 5.2 Participants' relationship and context of involvement with e-learning

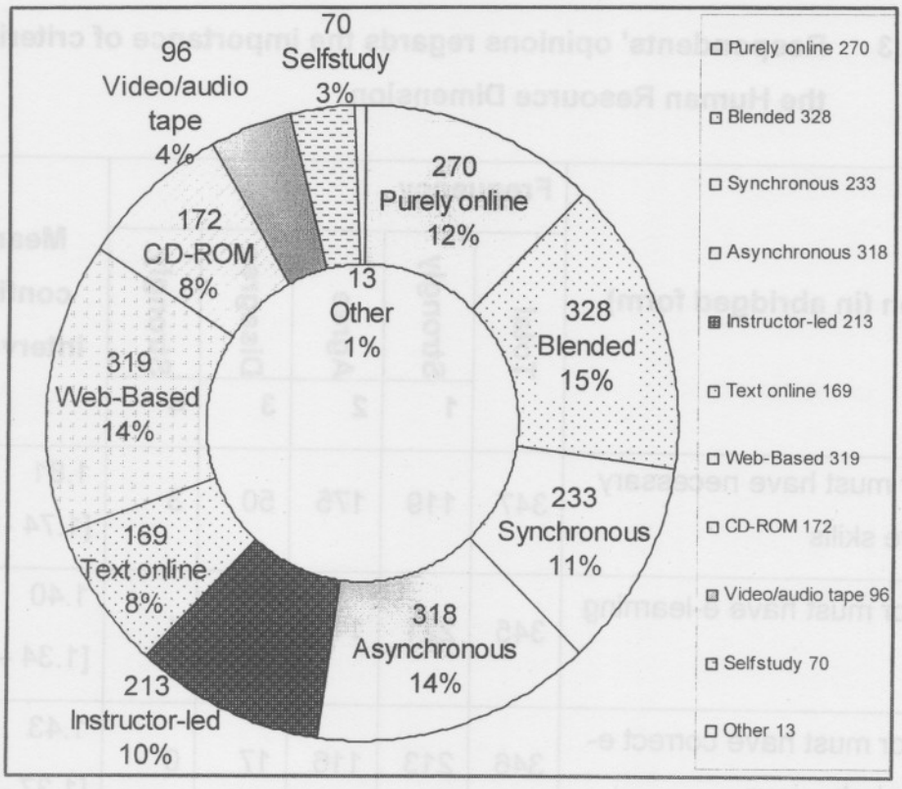
	What is the context of your involvement with e-learning?					
What is your current relationship with e-learning?		Universities and further education institutions	Schools	The workplace	Other	Row totals
	Learner	46	1	0	2	49
		93.88%	2.04%	0%	4.08%	12.93%
	Facilitator/ educator	95	14	5	1	115
		82.61%	12.17%	4.35%	0.87%	30.34%
	Manager	40	0	5	0	45
		88.89%	0%	11.11%	0%	11.87%
	Instructional designer	62	1	26	3	92
		67.39%	1.09%	28.26%	3.26%	24.27%
	Support team	20	0	7	0	27
		74.07%	0%	25.93%	0%	7.12%
	Other	31	0	6	14	51
		60.78%	0%	11.76%	27.45%	13.46%
	Column total	294	16	49	20	379
	Column %	77.57%	4.22%	12.93%	5.28%	100%

5.3.2.3.4 The type of e-learning experience

The question investigating ***the type of e-learning*** experience (Fig 5.4), namely "|In which types of e-learning do you have experience?", clearly indicates that the requirement is experience. All of the participants did have experience in one or more of the types of e-learning choices given, thus no one needed to be excluded from the sample as not complying with requirements for participation.

If none of the choices provided under types of e-learning were chosen, the respondents had to indicate what type of e-learning they used under a space left for other forms of e-learning. Of the thirteen respondents under the other category, no one could be excluded as not having had experience at all. Respondents could choose more than one type of e-learning to enable them to indicate all areas of their experience.

Figure 5.4 Respondents' experience in types of e-learning



5.3.2.3.5 Conclusion regarding the target group

From the preceding discussion it is evident that the sample involved with verifying the e-readiness criteria can be considered as representative of an experienced stakeholder e-learning community, and therefore their responses can be considered to be authentic.

5.3.2.4 Statistical analysis and discussion of the results from the Human Resources Dimension (SECTION B) of the e-readiness model questionnaire

Eleven questions related to essential human resources criteria were asked. The frequency per question, choices from 1–4 as well as the mean, confidence intervals and standard deviation are reflected in Table 5.3.

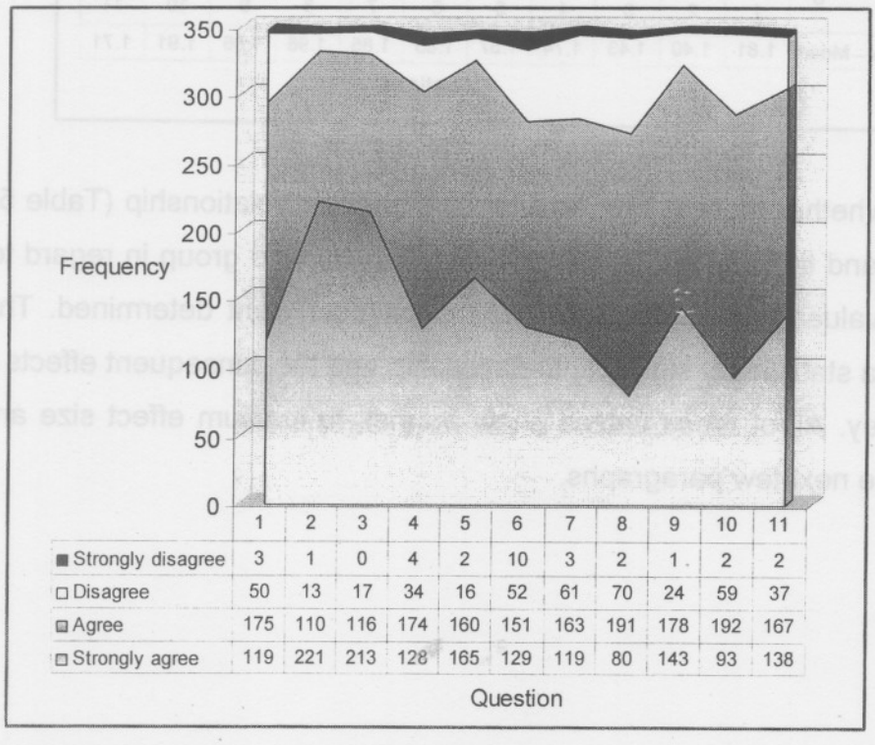
Table 5.3 Respondents' opinions regards the importance of criteria relating to the Human Resource Dimension

Criterion (in abridged form)	Frequency					Mean [and confidence interval 95%]	Standard deviation
	Total	Strongly agree	Agree	Disagree	Strongly disagree		
		1	2	3	4		
Learner must have necessary cognitive skills	347	119	175	50	3	1.81 [1.74 -1.89]	.70
Educator must have e-learning skills	345	221	110	13	1	1.40 [1.34 – 1.46]	.57
Educator must have correct e-learning behaviour	346	213	116	17	0	1.43 [1.37 – 1.49]	.58
E-learning plan for marketing	340	128	174	34	4	1.74 [1.67 – 1.81]	.67
Learner allowed time to change	343	165	160	16	2	1.57 [1.51 – 1.64]	.61
Learner testing in safe environment	342	129	151	52	10	1.83 [1.75 – 1.91]	.78
Learner must have subject matter pre-knowledge	346	119	163	61	3	1.85 [1.77 – 1.92]	.73

Criterion (abridged)	Frequency					Mean [and confidence interval 95%]	Standard deviation
	Total	Strongly	Agree	Disagree	Strongly		
		1	2	3	4		
Learner must have necessary computer skills	346	143	178	24	1	1.66 [1.59 – 1.72]	.61
Learner must possess correct e-learning behaviour	346	93	192	59	2	1.91 [1.84 – 1.98]	.67
Educator must be mentally ready for the course	344	138	167	37	2	1.71 [1.64 – 1.78]	.67

Most of the respondents, as indicated by the grey areas of Figure 5.5 of the frequency distribution, chose all the criteria as a requirements for e-readiness. The white and black areas indicate those respondents that did not agree.

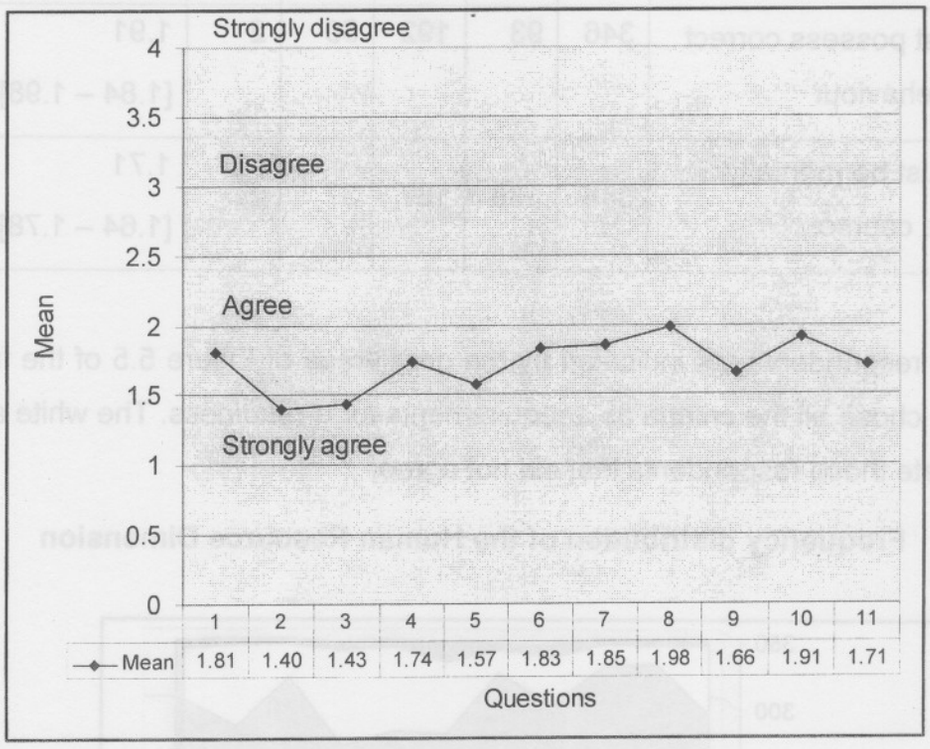
Figure 5.5 Frequency distribution of the Human Resource Dimension



The mean obtained per question also shows that most of the choices were in agreement that all the criteria were essential for e-readiness (Figure 5.5).

Figure 5.6 shows the mean of all respondents' choices. Irrespective of whether their involvement with e-learning had been in a tertiary training institution, school, workplace or other environment, it indicates that all eleven criteria of the Human Resources Dimension were selected as essential for e-readiness (See Fig 5.6).

Figure 5.6 Mean per question of the Human Resource Dimension



To determine whether there is any statistically significant relationship (Table 5.4) in the choices made and the specific characteristics of the sample group in regard to specific criteria, the p-values were calculated and the phi-coefficient determined. The criteria where there is a statistically significant relationship and the consequent effects sizes are indicated in grey. All of these criteria show a small to medium effect size and will be discussed in the next few paragraphs.

5.3.2.4.1 Significant relationships as regards the years of experience, roles and relationship with e-learning, the context of involvement with e-learning and the human resource criteria (see Appendix E)

As regards the three criteria in Table 5.4, of which a small significant relationship is indicated, a common trend can be observed from the cross tabulation tables attached (*AppendixE*), namely that most of the respondents agreed with the requirement. From this group, most were from the group with five to ten years of experience, followed by the group with less than five years, then the group with ten to fifteen years and lastly the group with more than fifteen years of experience.

One can deduce from the above that there is a greater significance in the relationship of the respondents with five to ten years of e-learning experienced as regards these criteria than the other groups. However the educators and facilitators had the biggest effect on the choices made as regards the role of the respondent in regard to e-learning. They were followed by the instructional designers.

The context that had the most significant influence on these particular requirements were the universities, colleges and other further education institutions, followed by the workplace, then schools and lastly contexts that were otherwise related to e-learning.

Table 5.4 The statistically significant relationship between the characteristics of the sample group and the choices made as regards the e-readiness criteria of the Human Resource Dimension

The Human Resource Dimension									
Criterion (abridged)	Years experience			Role or relationship			Context		
	Chi -square	P-value (≤.05)	Phi-coefficient	Chi -square	P-value (≤.05)	Phi-coefficient	Chi -square	P-value (≤.05)	Phi-coefficient
Learner must have the necessary cognitive skills	13.04	0.16	0.19	30.07	0.01	0.29	11.75	0.22	0.18
Educator must have e-learning skills	16.49	0.05	0.21	23.48	0.07	0.26	18.86	0.02	0.23

Educator must have correct e-learning behaviour	9.13	0.42	0.16	15.09	0.44	0.20	5.80	0.75	0.12
e-learning plan for marketing	4.40	0.88	0.11	8.25	0.91	0.15	21.05	0.01	0.24
Learner allowed time to change	13.47	0.14	0.19	18.08	0.25	0.22	10.52	0.30	0.17
Learner testing in safe environment	24.39	0.004	0.26	20.95	0.13	0.24	4.54	0.87	0.11
Learner must have subject matter pre-knowledge	6.58	0.68	0.13	29.08	0.01	0.29	3.93	0.91	0.48
Learner must be mentally ready for the course	17.48	0.04	0.22	25.74	0.04	0.27	7.77	0.55	0.15
Learner must have necessary computer skills	10.32	0.32	0.17	16.18	0.37	0.21	3.04	0.96	0.09
Learner must possess correct e-learning behaviour	12.58	0.18	0.19	20.55	0.15	0.24	13.52	0.14	0.19
Educator must be mentally ready for the course	12.07	0.20	0.18	8.25	0.91	0.15	9.28	0.41	0.16

5.3.2.4.2 Comments of respondents on the criteria for the Human resource Dimension

The ***comments*** by participants in the textbox provided (see open text report Appendix D) did not highlight any new requirement. The participants used it instead to express their opinions on issues that they thought were important. Also importance to note is that all the issues were incorporated later in the design of the audit instrument. The issues raised were also not always specifically related to the Human Resource aspect,

but they have been considered for the relevant dimension. None of the comments were repeated enough times to be considered.

However, cognisance has to be taken of the fact that few of the respondents indicated that the "must" requirement is too strong (fourteen comments noted) and not always appropriate as each situation is unique and should be judged as such. Some felt the word is to be replaced with "should". Most of the respondents were comfortable though with the use of the word and made their own suggestions including the word "must". These opinions support the reasoning that the e-readiness model must be user friendly to be applied in any context. This proved to be of importance later in the study after the model had been implemented and tested in a media centre.

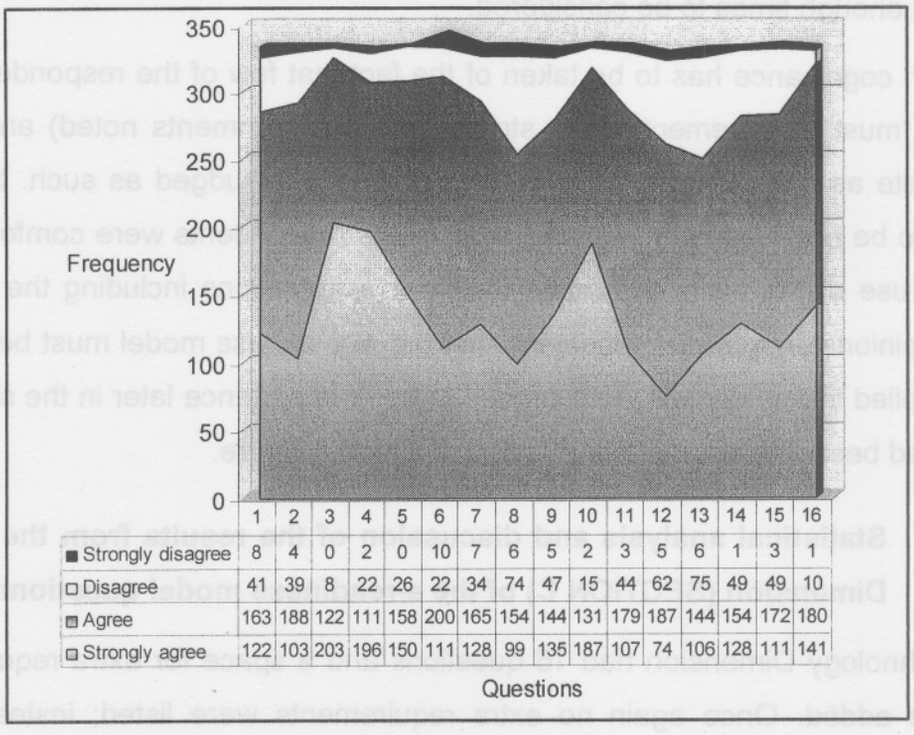
5.3.2.5 Statistical analysis and discussion of the results from the Technology Dimension (SECTION C) of the e-readiness model questionnaire

The Technology Dimension had 16 questions and a space for extra requirements that could be added. Once again no extra requirements were listed; instead comments similar to the Human Resources dimension were made. None of the comments could be considered a requirement. The comments made, positive or negative, were not substantiated with research and were not repeated enough times by other participants to be considered important.

It is obvious from the comments that some of the participants did not read the brief introductory paragraphs of the questionnaire properly as their criticism was inappropriate to the situation that was explained to them. The questionnaire did not provide for lengthy explanation on the purpose of the study and thus some did not seem to understand the overall purpose of the model and applied it directly to the context in which they were using e-learning at the time. If all the comments had to be included in the e-readiness model in some or other way, the model would have lost its user–friendliness, as including every detail under each criterion would be impractical.

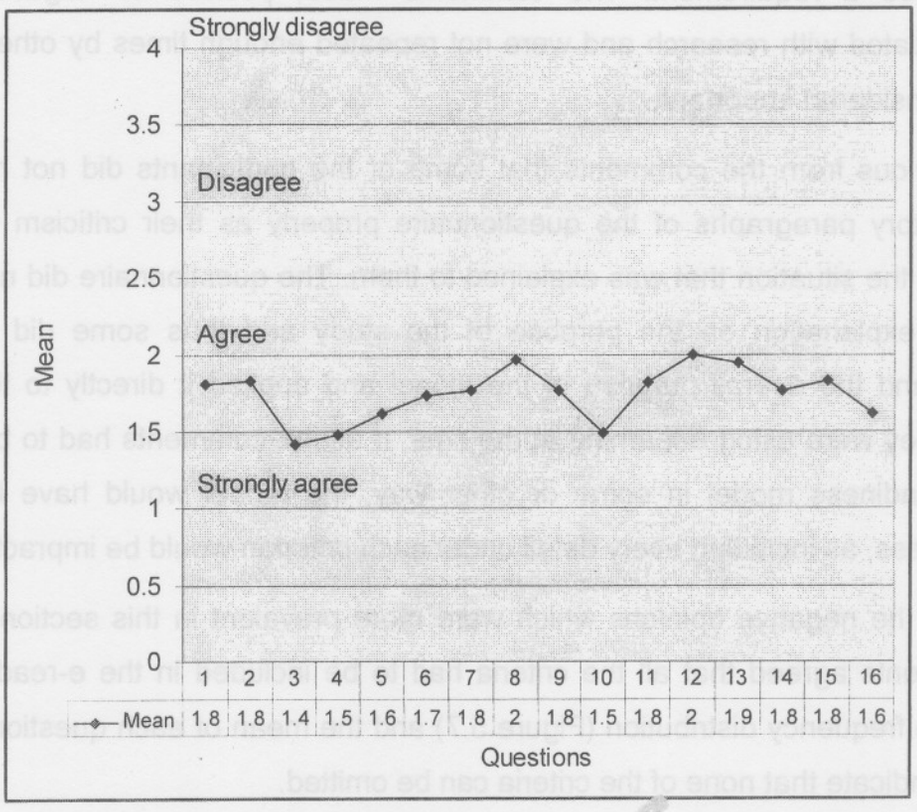
Despite the negative opinions which were more prevalent in this section, most of the respondents agreed that all the criteria had to be included in the e-readiness model. Both the frequency distribution (Figure 5.7) and the mean of each question (Figure 5.8) clearly indicate that none of the criteria can be omitted.

Figure 5.7 Frequency distribution of the Technology Dimension



	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Strongly disagree	8	4	0	2	0	10	7	6	5	2	3	5	6	1	3	1
Disagree	41	39	8	22	26	22	34	74	47	15	44	62	75	49	49	10
Agree	163	188	122	111	158	200	165	154	144	131	179	187	144	154	172	180
Strongly agree	122	103	203	196	150	111	128	99	135	187	107	74	106	128	111	141

Figure 5.8 Mean per question of the Technology Dimension



	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Mean	1.8	1.8	1.4	1.5	1.6	1.7	1.8	2	1.8	1.5	1.8	2	1.9	1.8	1.8	1.6

Table 5.5 contains the p-values and effect sizes (marked in grey) where the statistical analysis of the chi square was used to determine the significance of the relationship between the characteristics of the respondents and the choices they made.

Table 5.5 Statistically significant relationship between the characteristics of the sample population and the Technology Dimensions

The Technology Dimension									
Criterion (abridged)	**Years experience**			**Role or relationship**			**Context**		
	Chi -square	**P-value (≤.05)**	**Phi-coefficient**	**Chi -square**	**P-value (≤.05)**	**Phi-coefficient**	**Chi -square**	**P-value (≤.05)**	**Phi-coefficient**
E-learning material should appeal to both hemispheres	34.21	0.00	0.32	20.73	0.14	0.24	17.14	0.04	0.22
E-learning material must add aesthetic value	47.53	0.00	0.37	13.23	0.58	0.19	20.67	0.01	0.24
Technology infrastructure able to carry the load	3.78	0.70	0.10	6.04	0.97	0.13	7.16	0.62	0.14
Helpline for technical support	14.37	0.11	0.20	24.67	0.05	0.27	9.88	0.36	0.17
Graphics must not disturb download time	1.87	0.99	0.07	10.42	0.79	0.17	3.24	0.95	0.09
Pages of e-learning must have appropriate length	6.59	0.67	0.14	12.53	0.63	0.19	10.64	0.30	0.17
Material must have a printable version	26.91	0.00	0.28	19.35	0.19	0.24	7.42	0.59	0.14
E-learning site must have easy access	15.81	0.07	0.21	16.83	0.32	0.22	16.74	0.05	0.22

The Technology Dimension									
Criterion	Years experience			Role or relationship			Context		
	Chi -square	P-value (≤.05)	Phi-coefficient	Chi -square	P-value (≤.05)	Phi-coefficient	Chi -square	P-value (≤.05)	Phi-coefficient
There must be consistency in design	13.70	0.13	0.20	14.60	0.48	0.21	9.24	0.41	0.16
Consistent appearance of navigation bars	15.70	0.07	0.21	20.19	0.16	0.24	18.48	0.03	0.23
Hyperlinks must indicate where they lead	6.98	0.63	0.14	15.44	0.42	0.21	7.75	0.55	0.15
E-learning course must use scalable technology	29.30	0.00	0.30	12.22	0.66	0.19	15.62	0.07	0.21
Available anywhere, anytime to entire organisation	19.47	0.02	0.24	13.85	0.53	0.20	5.62	0.77	0.13
Technically simple to use	6.94	0.64	0.14	10.71	0.77	0.17	20.22	0.01	0.24
Must have centralized tracking and administration	17.04	0.04	0.22	10.71	0.77	0.17	12.56	0.18	0.19
Make use of the most appropriate delivery system	9.99	0.35	0.17	11.70	0.70	0.18	12.39	0.19	0.19

All effect sizes are small to medium, but none is practically significant.

5.3.2.5.1 Significant relationships as regards years of experience, roles and relationships, context of involvement with e-learning and the technology dimension (*See appendix E*)

Table 5.5 shows which criteria had significant relationships with the three mentioned characteristics of the respondents. Once again the respondents with five to ten years experience had the biggest impact on the criteria, requiring that e-learning should appeal to both hemispheres and add aesthetic value. They were followed by the group with fewer than five years experience, then ten to fifteen years and lastly by the group with more than fifteen years experience.

Just one significant relationship was found, namely that of the necessity to have a helpline for technical support. 75% of all respondents agreed with the statement, with the educators and facilitators having most influence on this choice.

As regards the context of involvement and the Technology Dimension, a respondent group of more than 80% was in agreement with the statements, with the respondents from the universities dominating this choice in all cases with more than 75%. They were then followed by the workplace respondents, the respondents indicating "other" as their relationship, and lastly by the group who indicated schools as their context of e-learning.

5.3.2.5.2 Statistical analysis and discussion of the results from the Pedagogical Dimension (SECTION C) of the e-readiness model questionnaire

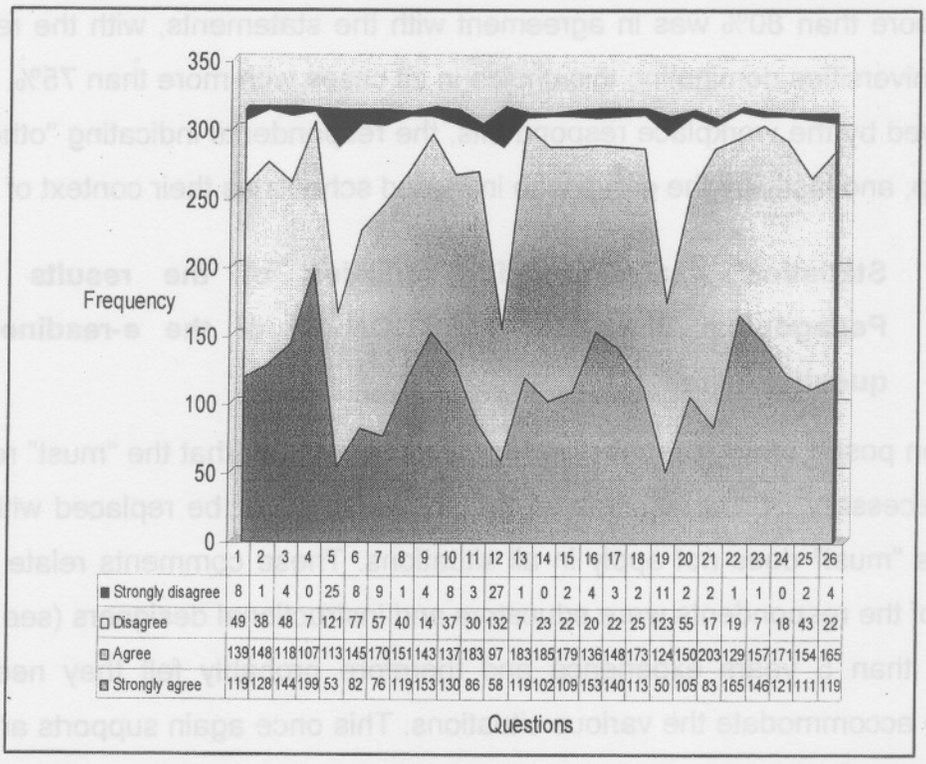
This section posed more responses where respondents felt that the “must” requirement was not necessary. A few commented that the word rather be replaced with the word “should” as "must" does not apply in all situations. These comments relate to the fact that most of the respondents were educators and instructional designers (see Table 5.2) with more than 5 years experience and therefore probably felt they needed more freedom to accommodate the various situations. This once again supports an approach which is more flexible thus being applicable to the goal of the e-readiness model’s design, namely to accommodate unique situations. Although all criteria must be considered and planned for there may be situations in which they do not apply without losing the most basic pedagogical requirement, namely meaningful learning.

A concern was the almost equal distribution of choices in agreement and against the criteria in support of unfocused goals. 46% of respondents did not agree. However, this

criterion was retained as only the ones with which more than 50% of the target population did not agree were discarded. The same distribution of choices was found with regard to the necessity for face-to-face contact sessions and the criterion that says e-learning should require less adjustment from the learner than other learning experiences. 50.6% of the respondents felt face to face contact sessions were not necessary, while 43% felt that e-learning did not necessarily require less adjustment. The face-to-face criterion was discarded and not included in the final e-readiness model.

Besides these three questions, the frequency distribution and the mean per question (see Figure 5.9 and 5.10) show that all criteria have been accepted as essential in preparing for an e-learning event except question 12, which is the face-to-face requirement.

Figure 5.9 Frequency distribution of the Pedagogical Dimension



	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26
Strongly disagree	8	1	4	0	25	8	9	1	4	8	3	27	1	0	2	4	3	2	11	2	2	1	1	0	2	4
Disagree	49	38	48	7	121	77	57	40	14	37	30	132	7	23	22	20	22	25	123	55	17	19	7	18	43	22
Agree	139	148	118	107	113	145	170	151	143	137	183	97	183	185	179	136	148	173	124	150	203	129	157	171	154	165
Strongly agree	119	128	144	199	53	82	76	119	153	130	86	58	119	102	109	153	140	113	50	105	83	165	146	121	111	119

Figure 5.10 Mean of all questions from the Pedagogical Dimension

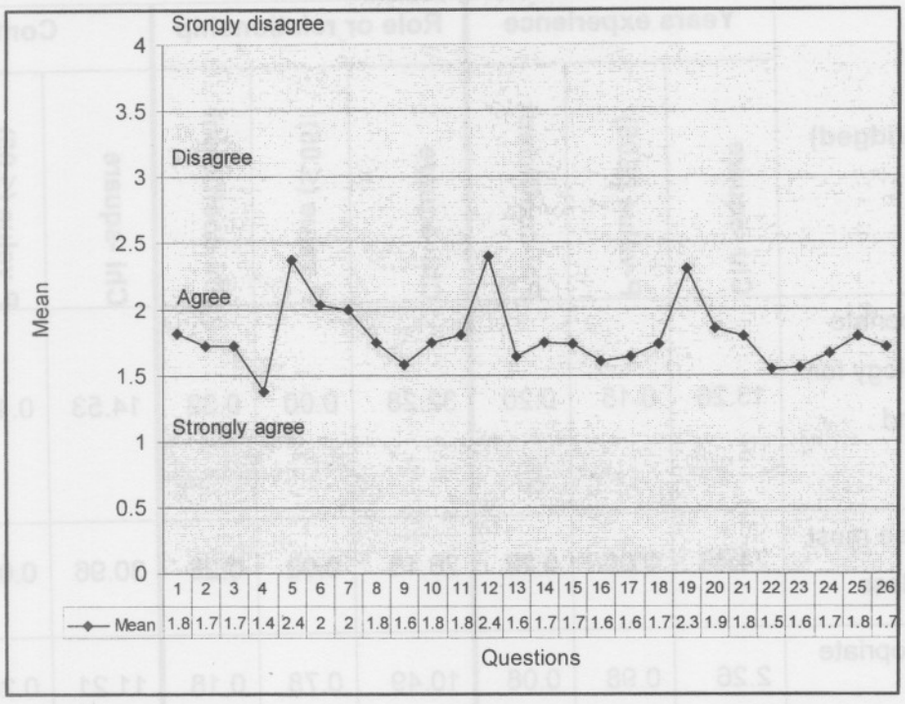


Table 5.6 contains the statistically significant relationship of data, namely the p-values and effect sizes, reflecting the relations of the characteristics of the population and the choices they made as regards the Pedagogical Dimension.

Table 5.6 Statistically significant relationship between the characteristics of the sample population and the Pedagogical Dimensions

The Pedagogical Dimension									
Criterion (abridged)	Years experience			Role or relationship			Context		
	Chi -square	P-value (≤.05)	Phi-coefficient	Chi -square	P-value (≤.05)	Phi-coefficient	Chi -square	P-value (≤.05)	Phi-coefficient
e-learning must support Constructivist epistemology	25.76	0.00	0.28	24.45	0.05	.027	14.90	0.09	0.21

The Pedagogical Dimension									
Criterion (abridged)	Years experience			Role or relationship			Context		
	Chi -square	P-value (≤.05)	Phi-coefficient	Chi -square	P-value (≤.05)	Phi-coefficient	Chi -square	P-value (≤.05)	Phi-coefficient
Must use appropriate interaction typology for collaboration and conversation	13.26	0.15	0.20	32.28	0.00	0.32	14.53	0.10	0.21
E-learning course must humanise the class	24.49	0.00	0.28	26.16	0.03	0.28	30.96	0.00	0.31
Must have appropriate activities	2.26	0.98	0.08	10.49	0.78	0.18	11.21	0.26	0.18
The goal orientation must support inductive learning	53.59	0.00	0.41	37.80	0.00	0.34	16.05	0.06	0.22
The learning material must be authentic reflecting real world conditions	11.86	0.22	0.19	31.41	0.00	0.31	13.97	0.12	0.21
The e-learning course must provide comprehensive resources	49.78	0.00	0.40	18.12	0.25	0.24	8.76	0.46	0.16
The course must use instructional processes for knowledge construction	10.90	0.28	0.18	15.01	0.45	0.22	17.96	0.03	0.24
The e-learning course must consider diversity amongst learners	8.55	0.47	0.16	16.15	0.37	0.22	17.08	0.04	0.23

The Pedagogical Dimension									
Criterion (abridged)	Years experience			Role or relationship			Context		
	Chi -square	P-value (≤.05)	Phi-coefficient	Chi -square	P-value (≤.05)	Phi-coefficient	Chi -square	P-value (≤.05)	Phi-coefficient
The course must comply with adult learning principles	11.93	0.21	0.19	21.66	0.11	0.26	20.20	0.01	0.25
The physical learning environment must be conducive to learning	10.78	0.29	0.18	10.94	0.75	0.54	7.52	0.58	0.15
Face-to-face contact sessions must be arranged in between	21.78	0.01	0.26	17.37	0.29	0.23	8.46	0.48	0.16
Time online must be supportive of learning process	13.46	0.14	0.20	16.72	0.33	0.23	22.47	0.00	0.27
The course must relate to the character of the subject	16.03	0.06	0.22	10.59	0.78	0.18	6.59	0.67	0.14
The course must be flexible as regards learning path and goals	16.23	0.06	0.22	13.21	0.58	0.20	15.71	0.07	0.22
Course architecture must have a modular design	11.50	0.24	0.19	14.77	0.46	0.21	13.12	0.15	0.20
Course must be modifiable	18.07	0.03	0.24	20.70	0.14	0.06	24.02	0.00	0.27
Course must address the correct target population	8.52	0.48	0.16	16.35	0.35	0.22	11.54	0.24	0.19

The Pedagogical Dimension									
Criterion (abridged)	Years experience			Role or relationship			Context		
	Chi -square	P-value (≤.05)	Phi-coefficient	Chi -square	P-value (≤.05)	Phi-coefficient	Chi -square	P-value (≤.05)	Phi-coefficient
Should require less adjustment from previous learning experience	17.05	0.04	0:23	12.05	0.67	0.19	9.45	0.39	0.17
Must allow for learner autonomy and self-pacing	9.90	0.35	0.17	30.61	0.01	0.31	6.31	0.70	0.14
Appropriate balance between transactional distance and learner autonomy must be maintained	16.84	0.05	0.23	15.21	0.43	0.22	20.17	0.01	0.25
Quick feedback time	17.21	0.04	0.23	25.26	0.04	0.28	18.00	0.35	0.23
Appropriate time and resources for activities	8.72	0.46	0.16	15.60	0.40	0.22	3.39	0.94	0.10
The learners' reading and typing skills are considered	4.53	0.87	0.12	13.49	0.56	0.20	9.77	0.36	0.17
Must make use of formative assessment focused on construction of knowledge	17.08	0.04	0.23	14.13	0.51	0.21	31.13	0.00	0.31
The size of the group matches the educational strategies	20.91	0.01	0.26	8.51	0.90	0.16	11.75	022	0.19

In this section the effect sizes ranged from small to medium to large, the largest being the relation between the years of experience in e-learning, the inductive goal orientation of e-learning and the comprehensive availability of resources.

5.3.2.5.3 Significant relationships between the years of experience, role and relationship towards e-learning, context of involvement with e-learning and the Pedagogical Dimension *(see Appendix e)*

Except for the requirement of an unfocused goal orientation and having face to face contact sessions, most respondents were in agreement with the criteria, following the same trend as in the case of previously discussed dimensions, namely the group with five to ten years experience had the biggest influence on the choices, followed by the group with less than five years experience, then the ten to fifteen year group and lastly the over fifteen years group. There was a fairly even distribution between respondents in agreement and in disagreement with the first two requirements mentioned. Despite the almost equal distribution between the respondents for and against the requirement, the respondents with the most influence followed the same trend than in the case of the other requirements, with the group with five to ten years experience having the biggest influence.

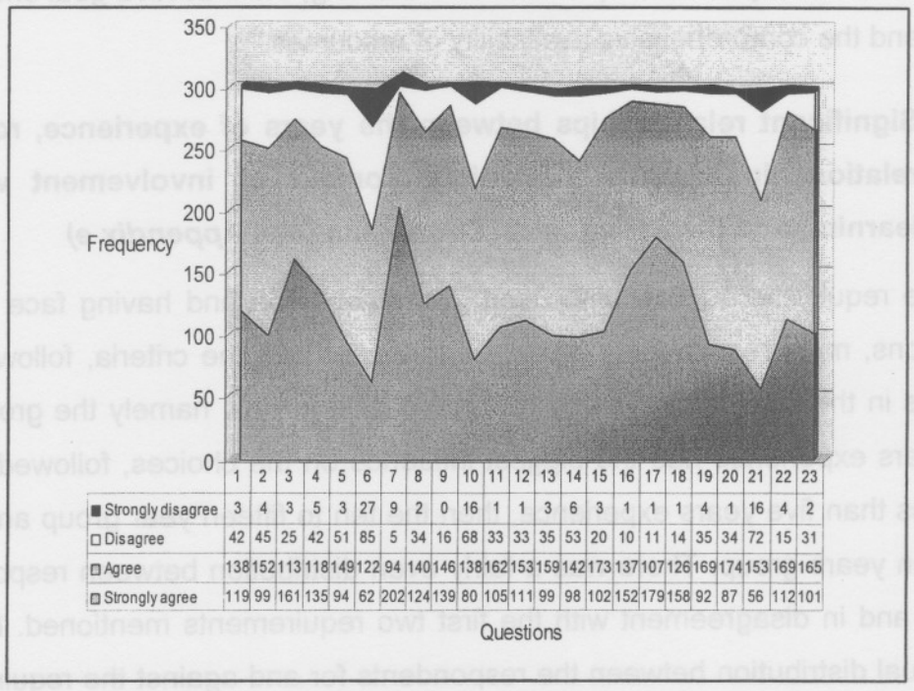
As regards the relationship that played the most influential role in the choices in agreement or disagreement with pedagogical criteria, the educators and facilitators had the most influence, followed by the instructional designers, then the "other" category, then learners and lastly the support team members.

With regard to the context of involvement with e-learning and the Pedagogical Dimension, there is evidence that university, college and further education respondents had the biggest influence on the choices made. They represented 77% of the respondents in all of the criteria in which a significant relationship was indicated.

5.3.2.6 STATISTICAL ANALYSIS AND DISCUSSION OF THE RESULTS FROM THE ORGANISATIONAL DIMENSION (SECTION D) OF THE e-READINESS MODEL QUESTIONNAIRE

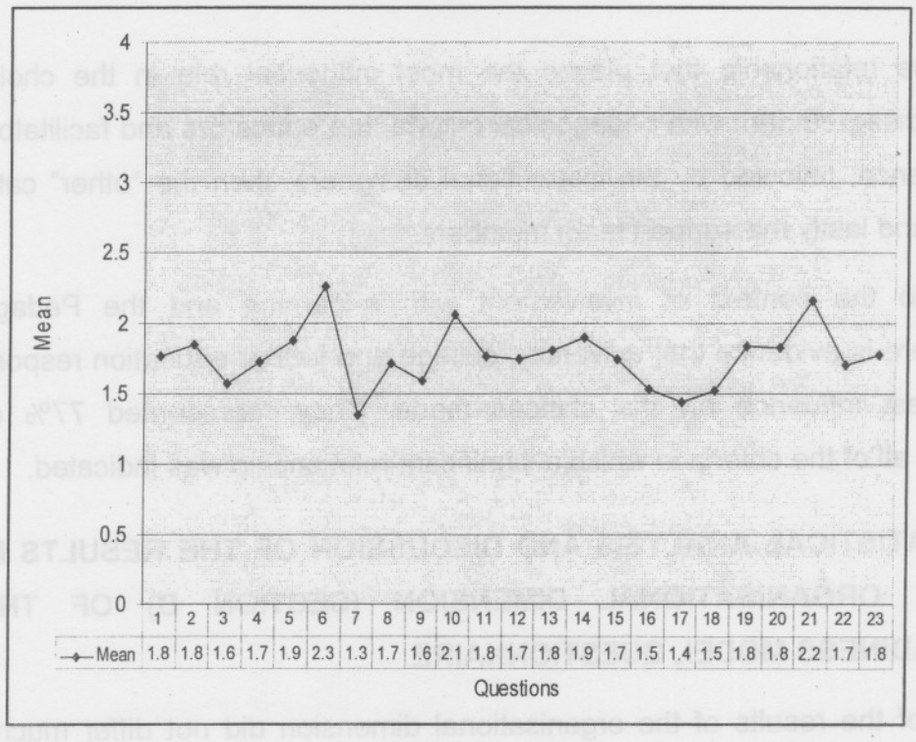
The outcome of the results of the organisational dimension did not differ much from previous dimensions. The frequency distribution and mean indicate that all criteria were accepted by most of the target group (see Figure 5.11 and 5.12).

Figure 5.11 Frequency distribution of the Organisational Dimension



	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
Strongly disagree	3	4	3	5	3	27	9	2	0	16	1	1	3	6	3	1	1	1	4	1	16	4	2
Disagree	42	45	25	42	51	85	5	34	16	68	33	33	35	53	20	10	11	14	35	34	72	15	31
Agree	138	152	113	118	149	122	94	140	146	138	162	153	159	142	173	137	107	126	169	174	153	169	165
Strongly agree	119	99	161	135	94	62	202	124	139	80	105	111	99	98	102	152	179	158	92	87	56	112	101

Figure 5.12 Mean of all questions of the Organisational Dimension



	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
Mean	1.8	1.8	1.6	1.7	1.9	2.3	1.3	1.7	1.6	2.1	1.8	1.7	1.8	1.9	1.7	1.5	1.4	1.5	1.8	1.8	2.2	1.7	1.8

There is a marked increase in incidences of statistically significant relationships between the years of experience and the organisational criteria. The effect sizes range from small to medium (See Table 5.7).

Table 5.7 Statistically significant relationship between the characteristics of the sample population and the Organisational Dimension

The Organisational Dimension									
Criterion (abridged)	**Years experience**			**Role or relationship**			**Context**		
	Chi -square	**P-value (≤.05)**	**Phi-coefficient**	**Chi -square**	**P-value (≤.05)**	**Phi-coefficient**	**Chi -square**	**P-value (≤.05)**	**Phi-coefficient**
Contact details of business unit must be displayed	17.75	0.03	0.24	13.30	.57	.21	9.85	0.36	0.18
Allow for learner registration	30.29	0.00	0.31	27.85	0.02	0.30	6.39	0.70	0.14
Effective security measures must be present to preserve authenticity of information	27.77	0.00	0.30	21.62	0.11	0.26	14.81	0.09	0.22
The privacy policy must be published	39.10	0.00	0.36	20.30	0.16	0.26	2.03	0.21	0.20
Feedback regulations must be published	39.14	0.00	0.36	16.14	0.37	0.23	12.10	0.20	0.20
The course must use branded educational content	30.09	0.00	0.32	40.32	0.00	0.36	10.91	0.28	0.19
The course must comply with legal requirements	10.20	0.33	0.18	9.55	0.84	0.17	7.56	0.57	0.15
There must be an e-learning project team	13.20	0.15	0.21	23.53	0.07	0.28	5.05	0.82	0.12

The Organisational Dimension									
Criterion (abridged)	**Years experience**			**Role or relationship**			**Context**		
	Chi -square	**P-value (≤.05)**	**Phi-coefficient**	**Chi -square**	**P-value (≤.05)**	**Phi-coefficient**	**Chi -square**	**P-value (≤.05)**	**Phi-coefficient**
A clear communication structure/strategy must be present	10.36	0.32	0.18	19.58	0.18	0.25	15.91	0.06	0.23
There must be officially approved time allowed for e-learning	17.45	0.04	0.24	13.91	0.53	0.21	21.31	0.01	0.26
Correct strategy if self-development were done	18.58	0.02	0.24	13.91	0.53	0.21	32.39	0.00	0.32
Instructions are given to work online	12.88	0.16	0.20	11.79	0.69	0.19	29.62	0.00	0.31
The course must improve the quality of the organisation's training	27.06	0.00	0.30	18.70	0.22	0.25	10.87	0.28	0.19
The course must be efficient	26.85	0.00	0.30	14.78	0.46	0.22	11.49	0.24	0.19
The course must provide educationist satisfaction	25.62	0.00	0.29	11.83	0.69	0.19	12.29	0.19	0.20
The course must provide learner satisfaction	19.81	0.01	0.25	12.49	0.64	0.20	30.49	0.00	0.31
There must be a plan to evaluate the success of the e-learning programme	16.75	0.05	0.23	24.32	0.06	0.28	12.47	0.18	0.20
The course must have enough support personnel	10.97	0.27	0.19	20.84	0.14	0.26	21.35	0.01	0.26

The Organisational Dimension									
Criterion (abridged)	Years experience			Role or relationship			Context		
	Chi -square	P-value (≤.05)	Phi-coefficient	Chi -square	P-value (≤.05)	Phi-coefficient	Chi -square	P-value (≤.05)	Phi-coefficient
Performance reviews and rewards for good progress	21.58	0.01	0.26	11.53	0.71	0.19	9.52	0.39	0.17
The course must be integrated into training matrices and career paths	20.25	0.01	0.26	17.39	0.29	0.24	14.82	0.09	0.22
The e-learning course must have reach	32.98	0.00	0.33	12.66	0.62	0.20	8.16	0.51	0.16
A positive culture towards online studying must be present	5.87	0.75	0.14	29.71	0.01	0.31	12.05	0.21	0.20
A plan to measure behavioural change and financial benefits must be present	12.46	0.18	0.20	21.21	0.13	0.26	7.62	0.57	0.15

5.3.2.6.1 Significant relationships between years of experience, role and relationship with e-learning, context of involvement with e-learning and the Organisational Dimension *(See Appendix E)*

Sixteen out of the 23 criteria falling under the Organisational Dimension had significant relationships with the years of experience of the respondents. They showed the same trend as previously discussed dimensions in that the group with five to ten years experience had the biggest influence on choices, followed by the group with less than five years experience, and then the groups with ten to fifteen and over fifteen years of experience.

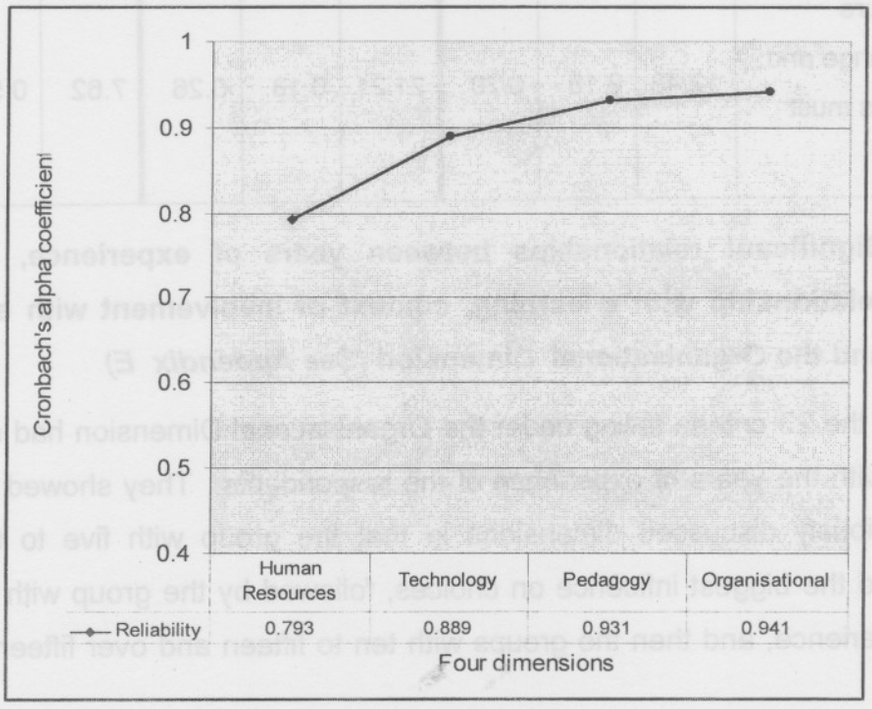
The same picture repeats itself as regards the role in e-learning, namely that the educators and facilitators of e-learning dominate the choices, followed by the instructional designers.

Regarding the context of involvement with e-learning, universities once again lead, having the biggest influence, followed by the workplace respondents, then the "other" category and lastly schools.

5.3.2.7 The internal reliability of the test

The Cronbach's coefficient alpha an index of reliability which are used with dichotomous or multi-point formatted questionnaires like the Likert scale, were used to determine the internal reliability of the test. The reliability or consistency with which the variables have been measured with the questionnaire is reflected in the results of the Cronbach alpha test, which was done on all four dimensions. The score can range from 0 to 1. The higher the score, the more reliable the test. All four dimensions have a reliability that ranges within the accepted range, with the accepted norm being a measure of more than 0.7 (SAS Institute, 1999; Santos, 1999; UCLA Academic technology services, 2006).

Figure 5.13 Reliability (Cronbach's coefficient alpha) of all four dimensions



5.3.2.8 Conclusion to phase two of the research project

In summary, in phase two of this research project all criteria except for one were adopted into the final e-readiness model. No new criteria were listed as requested. Many comments and opinions were raised, most of which supported the overall purpose of the research, namely to be flexible considering unique situations.

This concluded the second phase of the research. The criteria of the e-readiness model were verified by a group of experienced e-learning users. The next or third phase of the research entailed determining which evidence needs to be collected or be present in order to predict or state that the particular criterion has been complied with. This evidence had to be collected, verified and organised in an audit tool from which quantitative data could be obtained in order to determine the percentage of readiness of a workplace.

5.3.3 Phase three: Verification of the e-readiness audit instrument

After completion of phase two all the required criteria necessary for the e-readiness model had been verified, and the next phase in the research project could be completed. Phase three involved determining what evidence was needed under each criterion in order to prove whether or not there has been compliance with it. This evidence needed to be compiled into an audit instrument that can be used as a tool practically to evaluate an organisation's e-readiness.

5.3.3.1 Research method used to compile and verify the audit tool

A qualitative research process was followed in the design of the audit tool. The objective was to incorporate the generic criteria already identified into a more specific format that can be used as an audit tool. The evidence needed for each criterion was collected from literature on the subject and compiled into an instrument that allocated points for each piece of evidence present. Where it was possible, if the same evidence was required for different criteria, these were combined. For instance, the requirement for consistent navigation bars was combined with the technical simplicity requirements of the course. Each piece of evidence presented scored a point. In this way, the result of an audit could be quantified and reflected as a percentage of e-readiness (see Appendix F – the audit tool).

After compilation of the audit tool, it needed to be verified as suited to the specific context (organisation and type of e-learning) in which it would be used. For this purpose, a focus group was used from the specific organisation where it was implemented.

It is advisable that the tool always be verified in the context in which it will be implemented by a group of people knowledgeable about the e-learning efforts of the organisation to ensure that all criteria are relevant. This is necessary to consider special situations, e.g. where budget restrictions do not allow all criteria to be present. In this instance, a percentage performance can be obtained with consideration of the effect that non-compliance with certain criteria might have on the e-learning event. Thus the tool can still be useful in determining e-readiness as it provides the bigger picture or the ideal state "to be" for the organisation to determine for themselves what their chances of success are and to plan for remedies for the known shortcomings.

To verify the audit tool in the organisation where it was implemented, willing participants of the existing training officers' corps were requested to participate in an e-learning readiness focus group. The instrument was discussed in a daylong work session. Audio disks of this session are available on request. A core team of six people participated in the focus group. Their consent to participate, as well as the attendance register, is attached (see Appendix G). After discussion with this group, minor changes were made and the final instrument prepared for implementation (see Appendix H).

5.3.4 Phase four: Compilation of stakeholder questionnaires and implementation of the e-readiness audit exercise

During the final phase of the research, questionnaires to be completed by the main e-learning stakeholders (the facilitator, learners and manager of the e-learning course) were compiled to be used in conjunction with the audit tool. The questions reflected the criterion of the e-readiness model and the respondents had to indicate their choices on a Likert scale ranging from 1 to 4, where 1 indicated "strongly disagree" and 4 indicated "strongly agree". The questionnaire was necessary to

- counter any subjectivity and cross-check the researcher who acted as the auditor of the organisation;

- determine to what extent the audit results correlate with the users' responses to the e-learning event. In other words if the audit results were poor, whether the participant had also found the e-learning experience negative;
- gather evidence for certain criteria where physical evidence gathering through an audit is not possible, e.g. the criterion of fears being addressed as regards the e-learning event. The best way to determine that fears have been addressed would be to ask the participants how they felt about using e-learning as a training tool.

The respondents for these questionnaires were chosen on the basis of judgment of whom the questions mostly relate to and who would provide the most knowledgeable answer. The questionnaires for each group are attached (see Appendix I).

To summarise, the audit consisted of a physical inspection of e-learning courses to determine their percentage compliance with the predetermined criteria of the e-readiness model. It simultaneously made use of questionnaires where the learner, facilitator and manager had to answer these questions, which were mostly applicable to them. The database (see colour coding legend - Appendix A) uses colour coding to indicate which criteria had been physically audited, and who (learner, facilitator or manager) had received questionnaires. Questions in questionnaires are coded from sections A to D and numbered.

- A = Human Resource Dimension
- B = Technology Dimension
- C = Pedagogical Dimension
- D = Organisatonal Dimension

Thus, a question coded A 6.1 indicates it belongs to the Human Resource Dimension, measuring criterion 6 under this dimension. Some criteria required asking more than one question to determine full compliance with it. These criteria were coded after the decimal point e.g. 6.1–6.4. This means the one criterion has four different questions related to it. If the evidence needed for a criterion was part of evidence for another, the criteria were grouped together so that they were easier and more practical to audit, e.g. scalable technology and an easy access address were audited together.

5.3.4.1 Progress of the research – the physical audit

The physical audit:

The e-readiness model can be used at three different stages of an e-learning event, namely before the inception of a new e-learning event as part of the planning phase or during the execution of an e-learning event or after the event has taken place. During this research, the model was used during the ongoing presentation of e-learning courses. The audit results can be viewed in table 5.9.

The company used for the implementation of the e-readiness model had 8071 permanent employees, all of whom had access to a multimedia centre, where short e-learning courses could be done at any time during weekdays from 07:30 to 16:15. Besides the multimedia centre, online desktop training was also used. Due to ongoing development as regards online training throughout the organisation, the company felt that implementing the e-readiness model for online training might disrupt employees' work.

The consent of the Human Resource Manager of the company chosen for implementation of the model was obtained (See Appendix J). Implementation of the test model was allowed in the multimedia centre only.

The multimedia centre at the time of the study presented 233 different courses using six standard learner management programmes on an ongoing basis. The courses were purchased off the shelf and none was self-developed. The courses' duration as indicated on the company's internal network, varied from 2 to 4 hours. The course distribution per learner management programme can be seen in table 5.8.

The physical audit was done during December 2005. Owing to practical considerations, it was impossible for the researcher to audit all courses during working hours and it was decided rather to audit as many courses as possible over a three-day period.

Table 5.8 Number of courses per learner management programme used

Learner management programme	Number of courses using this programme
Learner management programme one	146
Learner management programme two	52
Learner management program three	6
Learner management program four	4
Learner management program five	6
Learner management program six	19

Five courses were audited (see table 5.9), three from learner management programme one, as most of the courses made use of this programme, as well as two others. The courses were all chosen randomly from the course schedule. On request to audit courses from learner management programme numbers 2, 3 and 6, the researcher was told that they were not operative, for unknown reasons.

The audit entailed completion of the audit tool on each of the five courses. It also included interviews with the media centre facilitator and manager to verify the existence of some of the evidence required. Despite the different learner management programmes used, it soon became clear that all followed the same basic approach and that there was no significant difference in the way course material was presented. The multimedia centre's facilitator confirmed this fact. Auditing more courses would not have changed the outcome of the results.

Table 5.9 Learner management programmes audited

Course name	Learner management programme	Number audited
Pipefitting materials and layout	Activpro no 84	1
Confined space entry	Activpro no 102	1
Scaffolds and ladders	Activpro no 127	1
Safety attitudes and actions	Iprax no 247	1
Teams that work	Harvard no 168	1

5.3.4.2 Statistical analysis and results of the audit

During the audit, points were awarded for each piece of evidence presented. The points under each criterion were totalled and expressed as a percentage. The total percentage was reflected as a percentage of compliance with the requirements of the e-readiness model. Table 5.10 (page 236) provides the results in accordance with each criterion of the five different courses observed.

5.3.4.2.1 Discussion of the results of the audit as regards the Human Resource Dimension

In this part of the audit, the company scored 13%. The following is a brief summary of the results of the audit:

- No attempt was made to determine any of the employees' thinking and problem-solving abilities. This is essential if a Constructivist training approach is followed. Considering that the courses audited followed a Behaviourist (see pedagogical audit results) approach, it was not necessary to determine the learners' cognitive abilities.
- There was no evidence that the employees were specifically prepared for the e-learning sessions. The media centre was a long-established facility and attendance was not compulsory. The facilitator in the media centre assisted learners with any queries they might have.
- None of the courses tested the employee's computer skills or stated any specific computer skills as a requirement. Although courses for computer skills training

were available, the booking system did not allow the employee to attend any other course than the one he/she booked. However, if computer skills were a problem in following the course, the facilitator could assist the individual by rescheduling him for computer courses where needed.

- The courses had no requirements regarding e-learning behaviour from the employee. This could have been crucial should the training have taken place in a different setting, namely at the desktop (in the office). The presence of other learners as well as the facilitator, as well as the fact that the courses were short and need not be completed over a long period, reduced the need for learner autonomy amongst the learners.
- The educators of the organisation were aware of the availability of courses as the titles of the courses were published on the company's intranet. An online scheduling system existed on the internal network, which could be used to schedule employees for training as needed. No meetings or information sessions were held to address concerns that they might have.
- As regards the skills required for e-learning facilitation and having a positive attitude towards e-learning, a permanent e-learning facilitator was always available. Although she was not qualified as a trainer, she was skilled in the day-to-day course administration and provision of technical assistance to the learners, and she was positive towards the total e-learning training effort. The courses did not provide for any online collaboration and a mediation role was not needed. However, the facilitator was not a subject matter expert in either training or in any of the content of the courses presented and simply functioned as a technical assistant to the learners.
- No specific plan or strategy could be found as regards the dissemination of information about the e-learning training presented in the media centre. None of the company's various smaller business units or any of the employees were represented in any way in any meeting or group to ensure proper sharing and dissemination of information.
- The researcher did not detect any attempts made to allow for time or opportunities for employees to get used to or test the courses in the media centre. However, employees were not restricted time-wise and could take as long as they needed to complete a course, despite the official schedule indicating the time to be 2 to 4

hours. Learners who could not complete courses could also return on a different day to do so. These arrangements accommodated the time issue and allowed enough time to test the programmes. Since the courses were not compulsory, one can assume that a person not ready for e-learning would not attend any of these courses. None of the courses was available as such in a face-to-face classroom training setup.

- Since the courses could not be tested beforehand and the expectation is that employees must undergo the training when they attend, one can assume that no time was allowed for testing the course in a safe non-threatening environment. The tracking facility was not disabled. Attending the course in the media centre also limited the amount of privacy the employee might need. However, this could also be advantageous as employees were allowed to communicate directly with each other, allowing for peer support should it be required. Privacy was also provided by seating each employee in a training booth partially separated from other learners. Training was done with audio sound provided over earphones. The latter also assisted in providing a private virtual learning space.
- None of the courses that were audited pre-tested or made any statements regarding the requisite pre-knowledge for the course.
- Although the course facilitator had no formal training or qualifications to run the course administration , informal on-the-job training had taken place and she was well experienced in running the administration of the various learner management programmes.

Although most of the criteria of the e-readiness model have not been complied with, the particular set-up of the e-learning courses in the media centre (the assistance of the facilitator present at all times as well as the long-standing practice of using the media centre), made up for many of the shortcomings. Some of these criteria may well have been planned for when the centre was started more than ten years ago – however this information is no longer available. The outcome of the learner, facilitator and manager questionnaires also indicate that there was no real problem or issues as regards the Human Resource Dimension present (see results on questionnaires in Table 5.10).

These results support the need to perform an audit together with evaluating the stakeholders' experiences by making use of questionnaires. The results of both assist in interpreting the e-readiness of an organisation in the specific context in which it is applied. If the researcher did not do a stakeholder evaluation the result of 13% would have been very negative, and the day-to-day operation of the media centre, without any problems being experienced by stakeholders, would not have been congruent with the result of the audit.

5.3.4.2.2 Discussion of the results of the audit as regards the Technology Dimension:

For this part of the audit the company scored 65%. Herewith, a brief description of the results of the audit:

- The presentation of the training material was visually attractive. It included sound as well as movement.
- The material added value aesthetically with minor problems observed, e.g. some graphics were not clear, as the pixels distorted the pictures. Pictures used did not all have titles and lacked explanations. Keywords were not highlighted.
- Although the facilitator could not recall the network capabilities, the centre had been designed to accommodate 37 computers, separated from the company's internal network, thus not interfering with the existing network load.
- There was no technical helpline with immediate online help available. Neither was there offline help available immediately. If a learner experienced technical problems the facilitator had to solve it by moving the learner to another computer. If the problems involved the whole network, the centre had to be closed and technical assistance had to be waited for. The same situation prevailed as regards technical problems experienced with any of the particular learner management programmes.
- The download times of all graphic material were acceptable.
- There was no printing facility should one of the learners wish to print any part of a course. The courses observed, except for one, also did not provide printing options. The Harvard course did offer printing options, the last of which was crucial to the completion of the course.

- The courses were easily accessible and the course facilitator provided assistance.
- None of the courses made use of hyperlinks; this was considered when quantifying the results.
- The courses were easily operable, with a few deviations here and there e.g. the need for navigation taking the learner to the beginning of the course when needed. There were no online collaboration opportunities. There was no indication as regards progress made or where one was in the course. In two of the courses there were no navigation abilities at all, causing a total lack of learner control.
- Except for a tool to evaluate learner satisfaction as regards the course, most of the courses did have assessment, tracking and a reporting options.
- Finding information in courses was frustrating. Sitemaps linked to parts of the courses were present but the lack of an index linked to the various parts of courses caused frustration in moving around inside them at one's own discretion. One of the courses did not have a sitemap either.
- Although all the courses presented the training material attractively, they lacked processing abilities. The learners were not able to produce and store their own material, nor were they able to communicate with each other or with a subject matter expert. These matters are a crucial requirement for the construction of meaningful learning.

Although the media centre was able to present interesting and stimulating courses, the current set-up had been designed for the presentation of courses in a behaviourist manner. The technology allowed no room for personal construction of meaning. The course set-up was very structured, with very little room for learner control and own initiative.

5.3.4.2.3 Discussion of the results of the audit as regards the Pedagogical Dimension

For this part of the audit the company scored 25%. The following is a summary of the result of the audit:

- None of the courses allowed for any form of interaction through either collaboration or online conversation. The centre often receives group bookings, and

discussion amongst group members is possible. The course designs did not require any discussions. If the learners did not start their own discussions spontaneously, none would take place.

- No effort had been made to humanise the courses. If a learner did not attend a course together with a group, there was no opportunity to relate to other learners with similar interests.
- The activities required were limited to answering questions (multiple-choice answers) during as well as after the course. The questions at the end of the course were also similar to the ones asked during the course. Besides these reflective or evaluative activities, only one other course presented with application and information activities. Motivational and orientation activities were absent.
- Only one of the courses presented with goals that allowed for inductive learning. The rest did not list any outcomes.
- Only one of the course's problems used as part of the course was complex enough to reflect the real-world context. Two of the courses presented with authentic problems similar to the real-world context, but they were not complex enough. One course actually simulated the incorrect way of dealing with the problem and the rest did not present with problems that reflect the complexity and the specific working conditions of the organisation.
- Only one course did not have any resources. The rest had varying degrees of the required resources. Three courses presented with only a glossary. However, the glossary was accurate, accessible and appropriate and there were instructions on how to use it and where to find it. Except for one course, all lacked variety in presenting different points of view, going beyond the obvious content required, accommodating different learning styles and not differentiating between optional and compulsory resources.
- Except for one course, the courses did not make use of instructional processes designed for knowledge building. The activities did not make use of modeling and scaffolding templates, and no hints or coaching were used as examples of responses required.

- No evidence could be found that the material had been tested to make sure that it accommodated the diversity amongst the learners. However, the researcher did not notice anything that was obviously offensive.
- All five courses differed in accommodating adult learning principles. They varied from very low to almost full compliance.
- The environment in which the learning took place was ideal. The media centre allowed employees not to be disrupted. It was quiet and the temperature well controlled with air-conditioning. The study booths were comfortable with enough privacy and desk space for taking notes if needed.
- Most of the course content related to the topic of discussion. Deviations found were the lack of any preview at the beginning of the courses. In four of the courses, there was no supplementary content. Three of the courses did not provide an index or module content before each new module. Overall, the content was divided into clear knowledge domains. Each module followed the same sequence and the division of content was sensible and consistent.
- None of the next three requirements of the e-readiness model was complied with. The course was not modifiable in a short space of time and without any great effort. No indication was given at the beginning as regards which type of learner the course was ideally suited to and no testing or time allocation indicated how much time had to be allowed for activities.
- None of the courses made adequate provision for learners with reading, writing or language disabilities. At most, it replaced text with English sound voice-overs. No language ability tests were done. This was especially disconcerting as most of the learners used English as their second language. No online typing abilities were tested. No criteria in this regard were given indicating what skills the learner needed to complete the course should he have any disabilities. The pages could not be enlarged (zooming in and out) and no indication was given as to whether the colours had been chosen to accommodate colour blindness. There were also no built-in facilities or tools to accommodate the blind, except for the sound.
- All five of the courses used formative assessments, of which only two required new knowledge construction with the assessment. The rest required repetition of memory testing. There was no explanation as regards the assessment procedure

and the grading process followed. No assignments were given or submission dates of assignments required.

- Since the courses did not allow for collaboration or required online assignments, there were no feedback regulations. It was impossible to determine whether the size of the virtual group was suited to the educational strategies chosen. This was considered during the quantification of performance.

5.3.4.2.4 Discussion of the results of the audit as regards to the Organisational Dimension

For this part of the audit, the company scored 20%. The results of the audit were as follows:

- None of the courses was linked in any way to a particular business unit in the company so as to take ownership for the content of the course. Thus, the content was not linked to a particular subject matter field and was never checked or updated for accuracy. Consequently the employees could not relate the content to a particular field of study and did not have contact details should they have any questions they would like to ask. The facilitator was not a subject matter expert in any of the courses presented and could not answer content-related questions. There is no governance over any of the courses by any subject matter field.
- There was no instruction at the beginning of courses as regards regulations on virus protection and plagiarism. This was probably not necessary, as no submission of own work was required. Most of the courses indicated copyright laws. The learners had to register and use their staff numbers as access requirement. This as well as the presence and supervision of the facilitator ensured that assessment was authentic.
- No published privacy policy existed that stipulated to what extent the employee's rights would be protected.
- The requirement on feedback regulations were not considered as it was not required to submit any work, and no online communication was required either.
- The content of the courses could no longer be considered to be current or accurate. The content had not been checked in the preceding two years by any of the company's internal subject matter experts. There were no published review dates or any structured system in place to review the content.

- Although three of the courses clearly stipulated copyright regulations, none referenced any material used or indicated where copyrighted material had been used.
- The requirements of having a project team with a strategy in cases where courses were self-developed had been left out of the audit.
- The company had a well-established custom of attendance of e-learning courses in the media centre. Procedures were in place so that scheduling could take place and people could attend. However, there were no records of how many people could be trained at any given time. The latter was not such a crucial requirement as the centre allowed for only thirty-seven employees. This would not have been the case if the course had been presented at employees' desktops company-wide.
- The requirement on self-development of the course was not considered as part of the audit as all courses had been bought off the shelf.
- The next requirement on instructions on practical ways to learn online was also not considered, as none of the courses needed it. They were all short courses. This would have been a requirement should the course have been longer than a day and completed at the employees desktop, or if work had to be completed online and submitted for assessment.
- The courses did not score anything on quality control, as wide consultation and input from subject matter experts were absent.
- The operation of the media centre could not be considered efficient as not all the computers were occupied. The annual utilisation results also reflected this (see Figure 5.14). However, there seemed to be enough staff members to deal with employees' needs and the time allowed for each course was sufficient.
- The courses did not have the company's educationist clearance as satisfactory. The company trainers had completed no survey to determine whether the courses were sufficient for their particular needs.
- During the audit, none of the learners completed any learner satisfaction survey to indicate their satisfaction with the course.

- There was no plan that evaluated the success of the e-learning event. No technical or educational efficiency goals could be traced and no tool to evaluate user-friendliness or overall success of the event was present.
- There were no support teams of subject matter experts looking after the courses.
- There was no reward for employees' progress and success with the e-learning courses.
- The courses were not integrated in the standing training matrices of the various job positions.
- The courses were presented in a media centre and did not have any company-wide reach.
- However, there was a very strong self-study and learning culture in the company, which was captured in a company-wide policy.
- There was no study that could be traced on the financial benefit that the media centre as a whole has to the company's bottom line. The only assessment of behavioural change that took place was in the formative and summative assessments after the course. There was no follow-up in the job evaluation to determine whether the required levels of competence had been reached.

5.3.4.2.5 Conclusions with regard to the audit

The courses audited complied with the Constructivist epistemology to a limited extent. Whether meaningful learning did take place had not been determined and should be questioned.

The researcher is of the opinion that the media centre and the value that it can add are underestimated and the company, which can do much more to exploit the initial financial investment by adopting e-learning courses that will develop skills that are specifically required for the Information Age.

5.3.4.3 Statistical analysis and results of the stakeholder questionnaires

In this part of the research the same univariate statistical analysis methods were used as during phase two, namely frequency tables, the mean, standard deviation and confidence intervals. The bivariate analysis techniques used were contingency tables

and correlations (determined with the chi-square). P-values determined whether the relationship was meaningful and the Phi-coefficient was used to determine effect size.

5.3.4.4 Univariate Analysis

5.3.4.4.1 Discussion of the learner group sample

The company's media centre is visited daily. A random sample of all learners frequenting the media centre was acquired by obtaining learner feedback over a period of four months. Learner feedback questionnaires were gathered from November 2005 to the end of February 2006. The percentage utilisation of the media centre for the year May 2005 to April 2006 can be seen in Figure 5.14. During this period 4842 attendances were registered of people who used the centre to complete e-learning courses. These attendances may reflect the same person attending more than one course. However, this figure provided enough information for research during a period serving as a window reflecting normal activity right through the year.

857 persons attended courses during the period in which the research was conducted. In this same period, 1477 e-learning courses were presented. Some learners attended more than one course per day. This included the ABET courses (Adult Basic Education and Training), which were attended by 414 individuals. The ABET courses did not form part of this study and were excluded from any research applications. This left a total target population of 443 learners. As many of the learners attended more than one course per day, they were requested to complete one questionnaire per day on any course completed. 236 responses were obtained, representing a 53% sample from the targeted population attending courses over the four-month period.

Table 5.10 The results of an audit done of e-learning courses in the multimedia centre of an industrial workplace

	Course 84	Course 102	Course 127	Course 247	Course 168	Total
Human Resource Dimension	**%**	**%**	**%**	**%**	**%**	**%**
The employee must have the necessary cognitive skills for e-learning	0	0	0	0	0	0
The employee must be mentally ready for the course	33	33	33	33	33	33
The employee must have the necessary computer skills	33	33	33	33	33	33
The employee must possess the correct e-learning behaviour	0	0	0	0	0	0
The educator must be mentally ready for the e-learning course	33	33	33	33	33	33
The educator must have the necessary skills and a positive attitude towards e-learning	25	25	25	25	25	25
There is a plan for the dissemination of information	0	0	0	0	0	0
Time is allowed for people to change/adapt	0	0	0	0	0	0
A safe working environment is provided during the trial period	0	0	0	0	0	0
Employees have the necessary subject matter pre-knowledge	0	0	0	0	0	0
There is sufficient evidence of training of educators to use the administration tools	0	0	0	0	0	0
TOTAL	**13**	**13**	**13**	**13**	**13**	**13**

N/A = not applicable	Course 84	Course 102	Course 127	Course 247	Course 168	Total
The Technology Dimension	**%**	**%**	**%**	**%**	**%**	**%**
The e-learning material should appeal to both hemispheres of the brain	100	100	100	100	100	100
Aesthetically adds value	89	89	89	88	94	36
The technology infrastructure supports the course without interference of existing load	100	100	100	100	100	100
A helpline for technical support is available	0	0	0	0	0	0
Graphics used must not disturb download times	100	100	100	100	100	100
Printing options must be available	0	0	0	0	50	10
The course must be easily accessible	100	100	100	100	100	100
The hyperlinks must clearly indicate where they will lead to	N/A	N/A	N/A	N/A	N/A	N/A
The course is technologically simple to use	66	66	66	25	25	50
The course must have centralised tracking and administration	75	75	75	25	50	60
Information can be easily found in the course	50	50	50	0	75	45
The delivery system used is appropriate	60	60	60	60	60	60
TOTAL	**67**	**67**	**67**	**54**	**69**	**65**

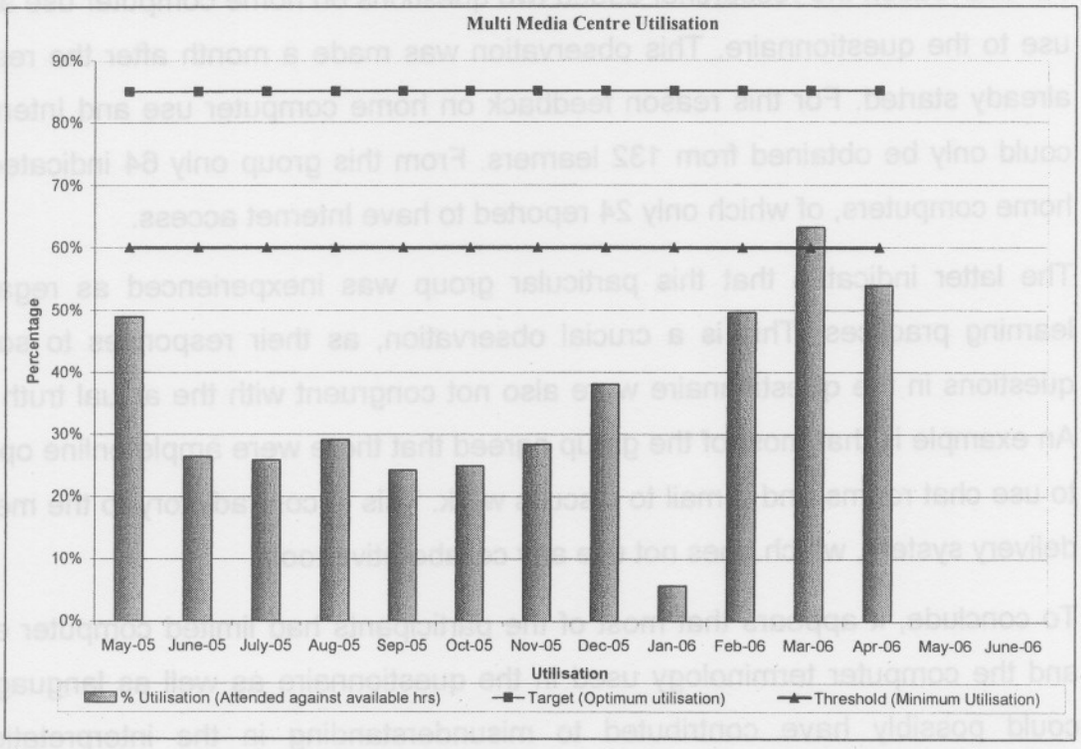
N/A = not applicable	Course 84	Course 102	Course 127	Course 247	Course 168	Total
The Pedagogical Dimension	%	%	%	%	%	%
There is appropriate interaction typology for collaboration and conversation	0	0	0	0	0	0
The learning group is humanised	0	0	0	0	0	0
The educational activities are appropriate	33	33	33	0	67	33
The goal orientation must be unfocused or support inductive learning	0	0	0	100	0	20
Problems are complex, authentic, concrete and related to the real world	50	0	0	0	100	30
Provision is made for any possible foreseen resources	43	31	31	0	71	35
Instructional processes designed for knowledge construction must be used	0	0	0	0	100	20
It is culturally sensitive and considers diversity amongst learners	33	33	33	33	33	33
The e-learning must comply with principles of adult learning	29	57	57	14	86	49
The physical learning environment must be conducive to learning	100	100	100	100	100	100
The course relates to the character of the subject and the users	57	57	57	71	86	66
The course is modifiable and thus flexible	0	0	0	0	0	0

N/A = not applicable	Course 84	Course 102	Course 127	Course 247	Course 168	Total
The Pedagogical Dimension (continued)	**%**	**%**	**%**	**%**	**%**	**%**
The course addresses the correct target population	0	0	0	0	0	0
There is appropriate allocation of time and resources to activities	0	0	0	0	0	0
Extra attention is given to employees' reading, writing and language abilities	10	30	30	10	0	16
There is formative assessment during the process of learning	11	22	22	11	33	20
There is an appropriate match between the size of the virtual group and the educational strategies	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*
TOTAL	**22**	**21**	**21**	**20**	**40**	**25**

The Organisational Dimension	**%**	**%**	**%**	**%**	**%**	**%**
The business details appears at the beginning of the course	0	0	0	0	0	0
The e-learning course possesses effective security measures	13	13	13	38	11	18
It has a published privacy policy	0	0	0	0	0	0
The feedback regulations are stipulated	N/A	N/A	N/A	N/A	N/A	N/A
It has branded educational content	36	36	36	36	36	36
The course complies with legal requirements (copyright laws and company policies)	33	0	0	33	66	26
There is a project team with a clear strategy	N/A	N/A	N/A	N/A	N/A	N/A
Time is set aside to learn	50	50	50	50	50	50
The steps of the e-learning course if self developed are correct	N/A	N/A	N/A	N/A	N/A	N/A
The course includes instructions on practical ways of working online	N/A	N/A	N/A	N/A	N/A	N/A

N/A = not applicable	Course 84	Course 102	Course 127	Course 247	Course 168	Total
The Organisational Dimension	**%**	**%**	**%**	**%**	**%**	**%**
There is evidence of quality of course content	0	0	0	0	0	0
The e-learning course must be effective	66	66	66	66	66	66
The course must satisfy the educationist	0	0	0	0	0	0
The e-learning course satisfy employees	0	0	0	0	0	0
There must be a plan to evaluate the success of the e-learning event	0	0	0	0	0	0
There must be enough support staff	0	0	0	0	0	0
Good progress and success through using the e-learning course must be rewarded	0	0	0	0	0	0
There is wide organisational consultation, implementation and integration	0	0	0	0	0	0
The e-learning course must have reach	0	0	0	0	0	0
There must be organisational-cultural support for e-learning	100	100	100	100	100	100
Behavioural change must be measured and reported	50	50	50	50	50	50
TOTAL	**20**	**19**	**19**	**22**	**20**	**20**

Figure 5.14 Percentage utilisation of the multimedia centre (Sasol Synfuels, 2005)



Consent for participation was obtained. The learners were not required to identify themselves, as they needed to be assured that there was no possibility that their line management could discriminate against them in any way should their opinions be negative. Anonymity was necessary to ensure that the feedback was honest and that the employees' privacy and all possible discrimination would be eliminated.

201 males and 25 females participated in this part of the research. Ten responses did not indicate gender. The sample group consisted mostly of young African males who had not previously done more than two e-learning courses, of which most (84.54%) were done in the company's media centre. The age distribution of the group can be seen in Figure 5.15. The group's race distribution can be seen in Figure 5.16 and the number of times e-learning courses were attended previously are reflected in Figure 5.17. All the respondents have a minimum qualification equivalent to the South African schools' grade 12 (the old matric), as this is a prerequisite for employment by the company.

It was clear from the learners' responses to the type of e-learning of which they had experience that they did not understand the different types of e-learning delivery

systems as described on the questionnaire. This may be due to ignorance about common e-learning terminology, owing to a lack of experience.

For this reason the researcher added two questions on home computer use and Internet use to the questionnaire. This observation was made a month after the research had already started. For this reason feedback on home computer use and Internet access could only be obtained from 132 learners. From this group only 64 indicated they had home computers, of which only 24 reported to have Internet access.

The latter indicates that this particular group was inexperienced as regards online learning practices. This is a crucial observation, as their responses to some of the questions in the questionnaire were also not congruent with the actual truth observed. An example is that most of the group agreed that there were ample online opportunities to use chat rooms and e-mail to discuss work. This is contradictory to the media centre delivery system, which does not use any collaborative tools.

To conclude, it appears that most of the participants had limited computer experience and the computer terminology used in the questionnaire as well as language barriers could possibly have contributed to misunderstanding in the interpretation of the questions.

Figure 5.15 The age distribution of the learner stakeholder group

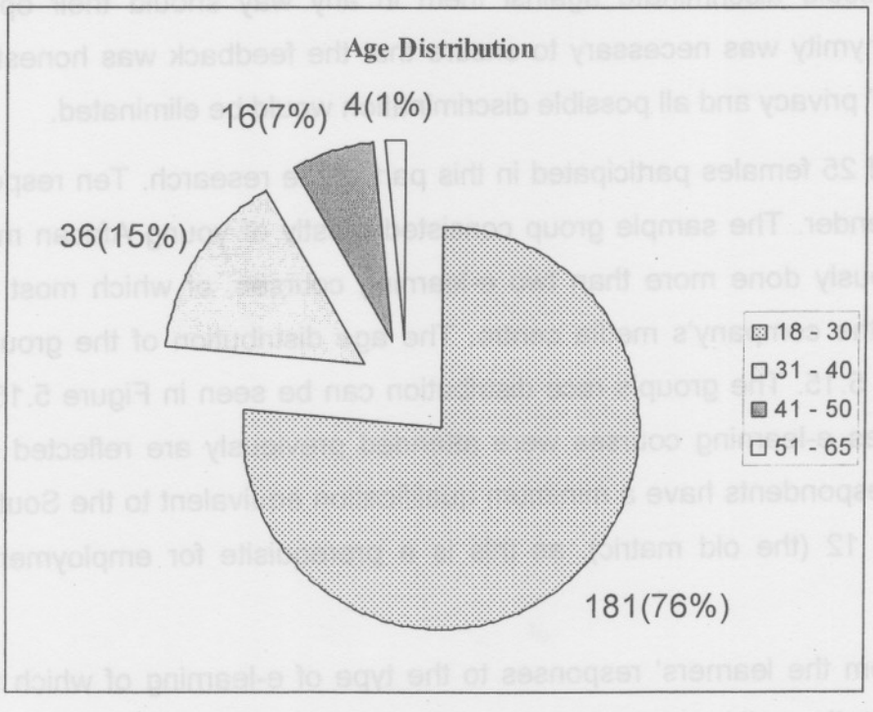


Figure 5.16 Race distribution of the learner stakeholder group

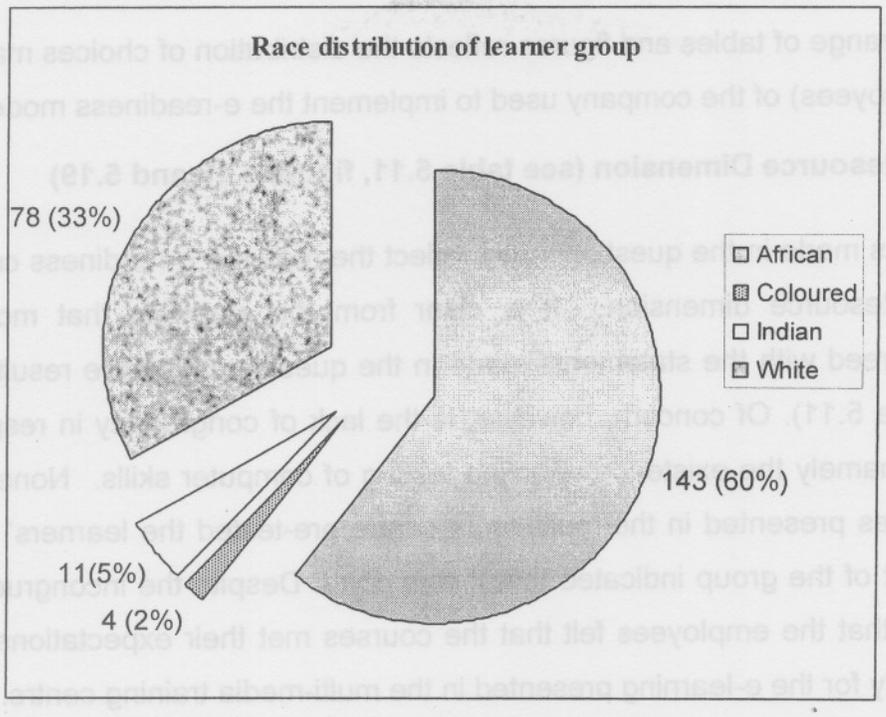
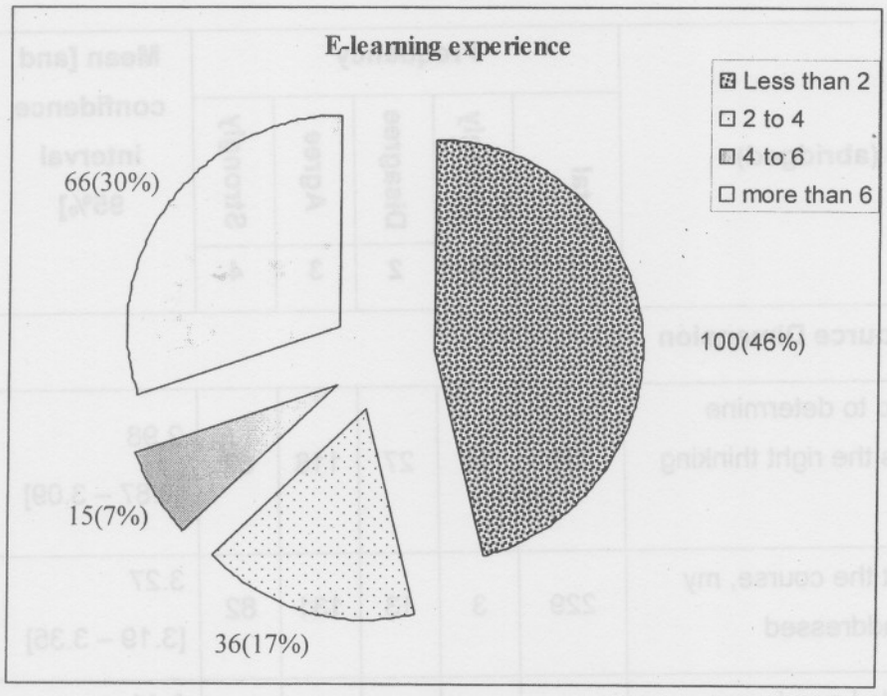


Figure 5.17 E-Learning experience of the learner stakeholder group



5.3.4.4.2 Statistical analysis and results of the learner stakeholder group's responses to questions asked in all four dimensions

The following range of tables and figures reflects the distribution of choices made by the learners (employees) of the company used to implement the e-readiness model.

The Human Resource Dimension (see table 5.11, figure 5.18 and 5.19)

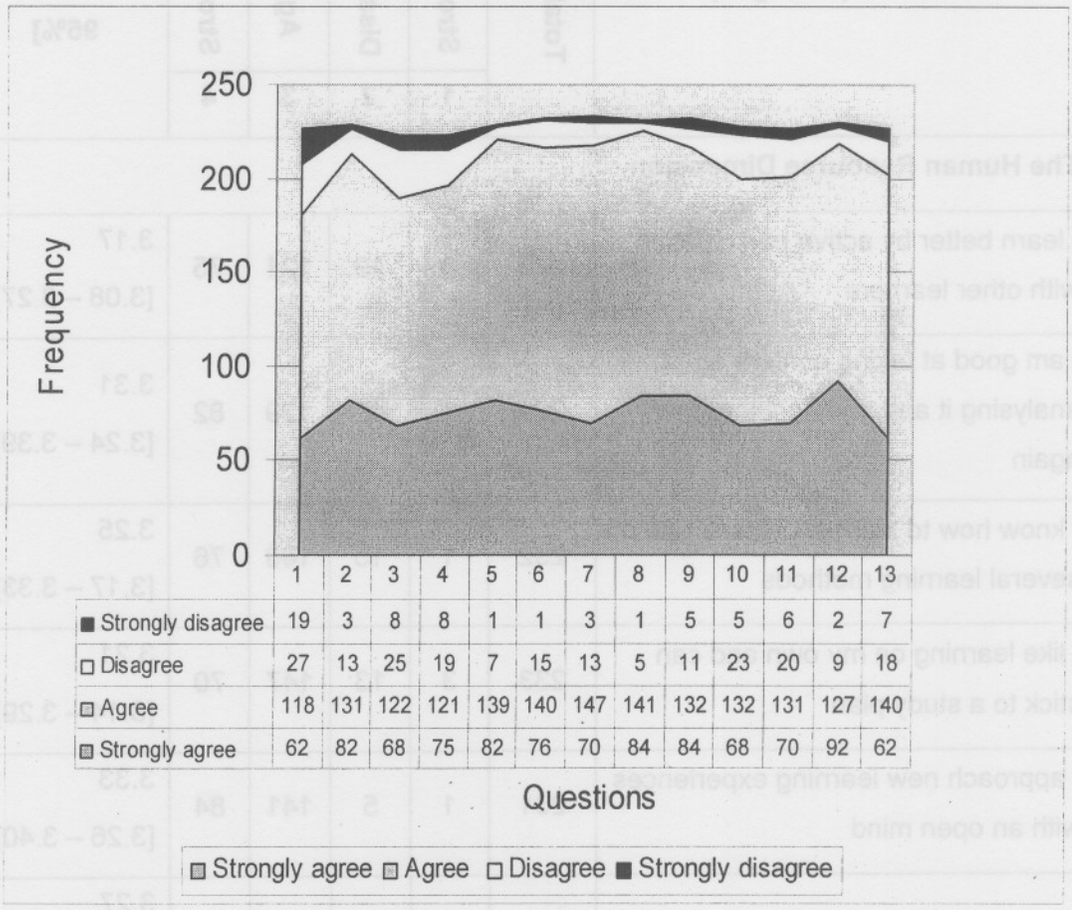
The statements made in the questionnaires reflect the required e-readiness criterion for the Human Resource dimension. It is clear from the statistics that most of the employees agreed with the statements made in the questionnaire (see results marked in grey in table 5.11). Of concern, however, is the lack of congruency in responses to one question namely the existence of online testing of computer skills. None of the e-learning courses presented in the multimedia centre pre-tested the learners' computer skills, yet most of the group indicated that it was done. Despite the incongruence, one must assume that the employees felt that the courses met their expectations and that they were ready for the e-learning presented in the multi-media training centre.

Table 5.11 Frequency table indicating the learner stakeholder group's opinions as regards the Human Resources Dimension criteria

Criterion (abridged)	Frequency					Mean [and confidence interval 95%]	Standard deviation
	Total	Strongly	Disagree	Agree	Strongly		
		1	2	3	4		
The Human Resource Dimension							
I have been tested to determine whether I possess the right thinking abilities	226	19	27	118	62	2.98 [2.87 – 3.09]	0.85
I am ready to start the course, my fears have been addressed	229	3	13	131	82	3.27 [3.19 – 3.35]	0.62
The computer skills I need were described and tested	225	9	25	122	69	3.11 [3.01 – 3.21]	0.75

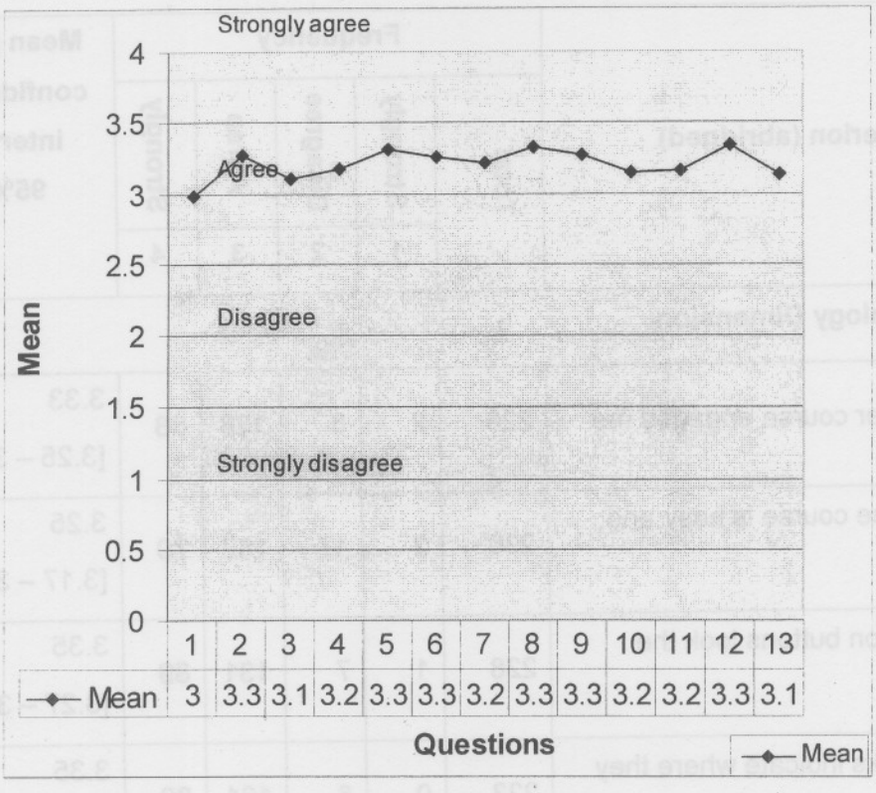
Criterion (abridged)	Frequency					Mean [and confidence interval 95%]	Standard deviation
	Total	Strongly	Disagree	Agree	Strongly		
		1	2	3	4		
The Human Resource Dimension							
I learn better by active participation with other learners	223	8	19	121	75	3.17 [3.08 – 3.27]	0.73
I am good at taking content apart, analysing it and putting it together again	229	1	7	139	82	3.31 [3.24 – 3.39]	0.55
I know how to learn and make use of several learning methods	232	1	15	140	76	3.25 [3.17 – 3.33]	0.58
I like learning on my own and can stick to a study plan	233	3	13	147	70	3.21 [3.14 – 3.29]	0.60
I approach new learning experiences with an open mind	231	1	5	141	84	3.33 [3.26 – 3.40]	0.54
The attention I received from the course facilitator is satisfactory	232	5	11	132	84	3.27 [3.18 – 3.35]	0.65
I have been prepared for the course and am convinced of its benefits	228	5	23	132	68	3.15 [3.06 – 3.24]	0.68
I have been exposed to computer learning awareness sessions and feel I had enough time to get used to e-learning	227	6	20	131	70	3.16 [3.07 – 3.25]	0.69
I was allowed enough privacy to test the course in order to get used to it	230	2	9	127	92	3.34 [3.26 – 3.42]	0.59
The requisite pre-knowledge was determined beforehand	227	7	18	140	62	3.13 [3.04 – 3.22]	0.67

Figure 5.18 Frequency distribution of the learner stakeholder group's responses to the questions regarding the Human Resource Dimension



	1	2	3	4	5	6	7	8	9	10	11	12	13
Strongly disagree	19	3	8	8	1	1	3	1	5	5	6	2	7
Disagree	27	13	25	19	7	15	13	5	11	23	20	9	18
Agree	118	131	122	121	139	140	147	141	132	132	131	127	140
Strongly agree	62	82	68	75	82	76	70	84	84	68	70	92	62

Figure 5.19 The mean distribution of the learner stakeholder group's responses to the Human Resource Dimension questions



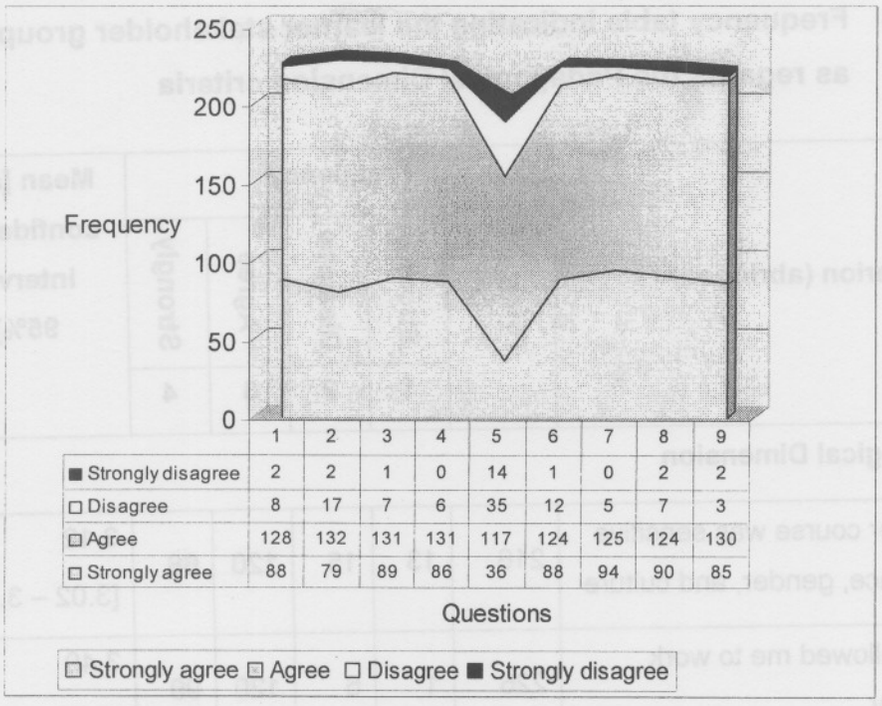
The Technology Dimension (see Table 5.12, and Figures 5.20 and 5.21)

As regards the Technology Dimension the same incongruence appears with regard to responses to two questions, namely the hyperlinks of the course indicating where they lead and the downloadable files indicating their size. None of the courses used hyperlinks or allowed files to be downloaded. However, the statistics indicate that this particular group felt all requirements (see results marked in grey of table 5.12) of their questionnaire were complied with and therefore one must assume that the technology was adequate for their particular needs.

Table 5.12 Frequency table indicating the learner stakeholder group's opinions as regards the Technology Dimension criteria

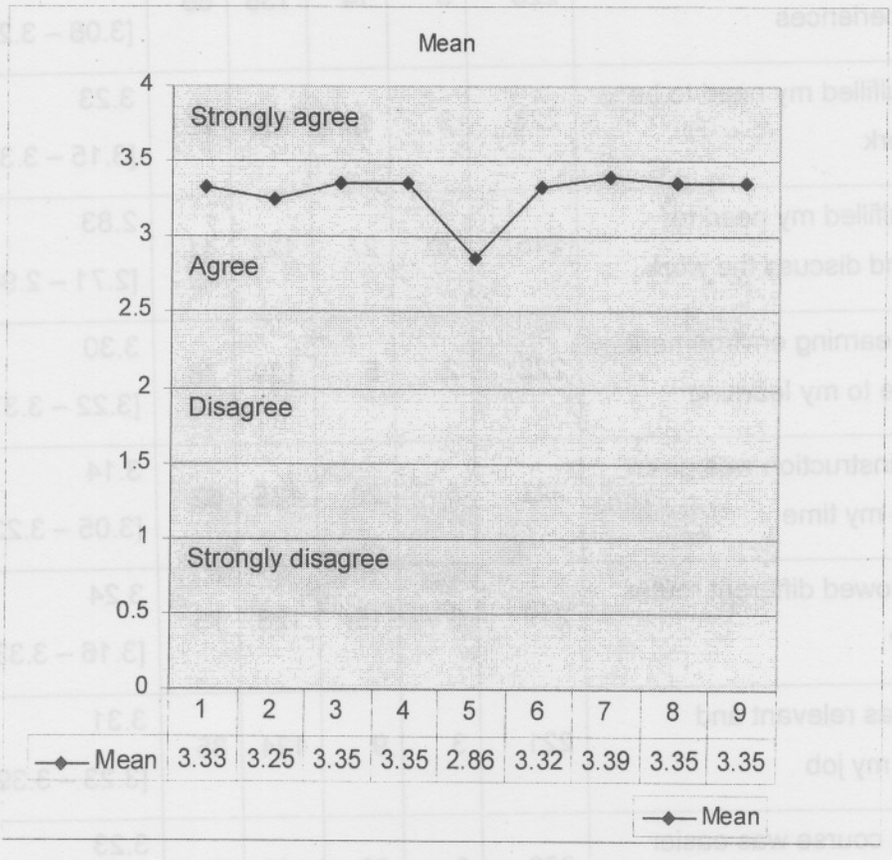
Criterion (abridged)	Frequency					Mean [and confidence interval 95%]	Standard deviation
	Total	Strongly	Disagree	Agree	Strongly		
		1	2	3	4		
The Technology Dimension							
The computer course engaged me	226	2	8	128	88	3.33 [3.25 – 3.41]	0.59
Accessing the course is easy and simple	230	2	17	132	79	3.25 [3.17 – 3.33]	0.62
The navigation buttons look the same	228	1	7	131	89	3.35 [3.27 – 3.42]	0.56
The hyperlinks indicate where they will lead	223	0	6	131	86	3.35 [3.28 – 3.42]	0.53
The sizes of downloadable files are indicated	202	14	35	117	36	2.86 [2.75 – 2.97]	0.78
The course was technically simple to use	225	1	12	124	88	3.32 [3.25 – 3.40]	0.59
The course has the ability to assess and allow for feedback	224	0	5	125	94	3.39 [3.27 – 3.46]	0.53
The course has an index and sitemap	223	2	7	124	90	3.35 [3.27 – 3.43]	0.58
The training delivery system chosen met my thinking and training needs	220	2	3	130	85	3.35 [3.28 – 3.42]	0.55

Figure 5.20 Frequency distribution of the Technology Dimension



	1	2	3	4	5	6	7	8	9
Strongly disagree	2	2	1	0	14	1	0	2	2
Disagree	8	17	7	6	35	12	5	7	3
Agree	128	132	131	131	117	124	125	124	130
Strongly agree	88	79	89	86	36	88	94	90	85

Figure 5.21 Mean distribution of the Technology Dimension



	1	2	3	4	5	6	7	8	9
Mean	3.33	3.25	3.35	3.35	2.86	3.32	3.39	3.35	3.35

The Pedagogical Dimension (see Table 5.13, and Figures 5.22 and 5.23)

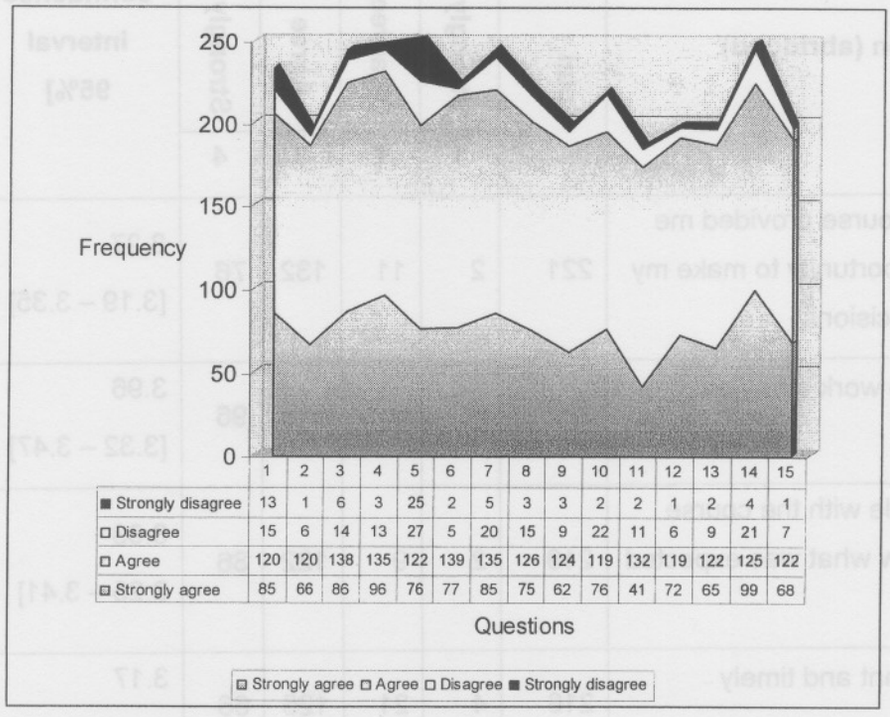
Table 5.13 Frequency table indicating the learner stakeholder group's opinions as regards the Pedagogical Dimension criteria

Criterion (abridged)	Frequency					Mean [and confidence interval 95%]	Standard deviation
	Total	Strongly	Disagree	Agree	Strongly		
		1	2	3	4		
The Pedagogical Dimension							
The computer course was sensitive to my age, race, gender, and culture	216	13	15	120	68	3.12 [3.02 – 3.22]	0.78
The course allowed me to work independently	226	1	6	120	99	3.40 [3.32 – 3.47]	0.56
I was allowed to make use of my own work experiences	223	6	14	138	65	3.17 [3.08 – 3.26]	0.65
The course fulfilled my need to be efficient at work	223	3	13	135	72	3.23 [3.15 – 3.31]	0.61
The course fulfilled my need to collaborate and discuss the work	215	25	27	122	41	2.83 [2.71 – 2.94]	0.87
The physical learning environment was conducive to my learning	222	2	5	139	76	3.30 [3.22 – 3.37]	0.55
Useful online instruction was given on how to use my time	222	5	20	135	62	3.14 [3.05 – 3.23]	0.66
The course allowed different routes one can follow	219	3	15	126	75	3.24 [3.16 – 3.33]	0.63
The content was relevant and appropriate to my job	221	3	9	124	85	3.31 [3.23 – 3.39]	0.61
The e-learning course was easier than previous learning experiences	220	2	22	119	77	3.23 [3.14 – 3.31]	0.65

Criterion (abridged)	Frequency					Mean [and confidence interval 95%]	Standard deviation
	Total	Strongly	Disagree	Agree	Strongly		
		1	2	3	4		
The computer course provided me with enough opportunity to make my own learning decisions	221	2	11	132	76	3.27 [3.19 – 3.35]	0.59
I was allowed to work at my own pace	222	1	6	119	96	3.96 [3.32 – 3.47]	0.56
I was comfortable with the course design and knew what was expected of me	219	2	9	122	86	3.33 3.25 – 3.41]	0.60
I received relevant and timely feedback	216	4	21	125	66	3.17 [3.08 – 3.26]	0.67
I had enough time and resources to complete activities	215	1	7	122	85	3.35 [3.27 – 3.42]	0.56

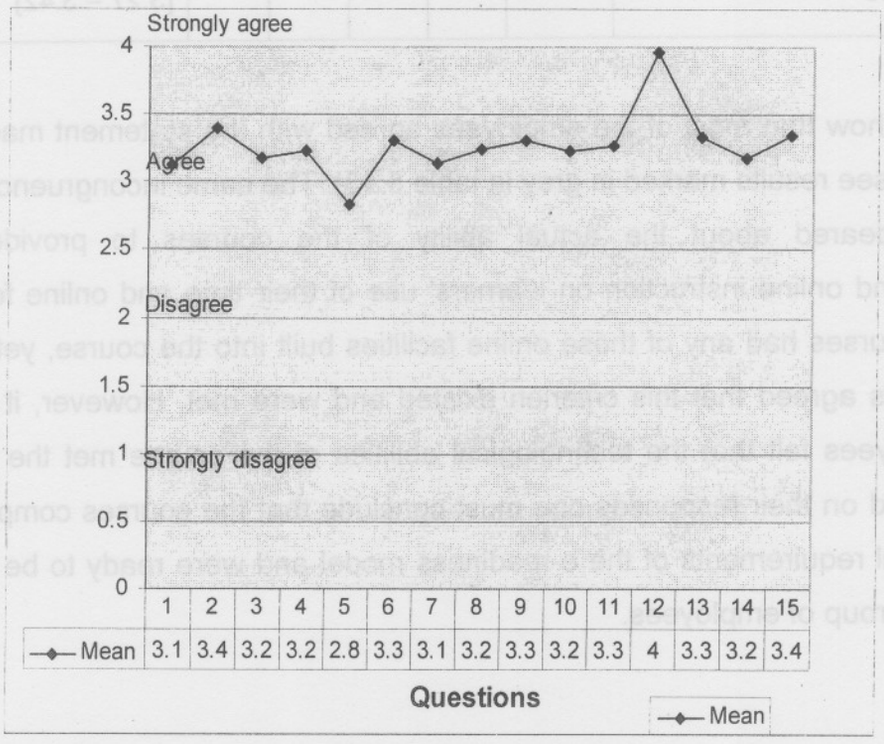
The statistics show that most of the employees agreed with the statement made in the questionnaire (see results marked in grey in table 5.13). The same incongruence in their responses appeared about the actual ability of the courses to provide online collaboration and online instruction on learners' use of their time and online feedback. None of the courses had any of these online facilities built into the course, yet most of the respondents agreed that this criterion existed and were met. However, it appears that the employees felt that the technological abilities of the course met the required standard. Based on their responses one must conclude that the courses complied with the pedagogical requirements of the e-readiness model and were ready to be used by this particular group of employees.

Figure 5.22 Frequency Distribution of the Pedagogical Dimension



	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Strongly disagree	13	1	6	3	25	2	5	3	3	2	2	1	2	4	1
Disagree	15	6	14	13	27	5	20	15	9	22	11	6	9	21	7
Agree	120	120	138	135	122	139	135	126	124	119	132	119	122	125	122
Strongly agree	85	66	86	96	76	77	85	75	62	76	41	72	65	99	68

Figure 5.23 Mean distribution of the Pedagogical Dimension



	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Mean	3.1	3.4	3.2	3.2	2.8	3.3	3.1	3.2	3.3	3.2	3.3	4	3.3	3.2	3.4

The Organisational Dimension (See Table 5.14)

Table 5.14 Frequency table indicating the learner stakeholder group's opinions as regards the Organisational Dimension criterion

Criterion (abridged)	Frequency					Mean [and confidence interval 95%]	Standard deviation
	Total	Strongly	Disagree	Agree	Strongly		
		1	2	3	4		
The Organisational Dimension							
I am positive towards e-learning and my colleagues and managers support it as a good thing	220	1	6	124	89	3.36 [3.29 – 3.44]	0.56

Most of the employees agreed on the criterion and based on their opinions one must assume that the organisational culture is ready for e-learning.

5.3.4.5 Bivariate Analysis

Similar to the statistical techniques used in phase two of this research project, cross tabulation was used as a bivariate method of analysis. This was done to determine whether there is any statistically significant relationship between the characteristics of the employees (gender, age, race and previous e-learning experience) and their choices. The chi-square and the p-values were calculated and the effect sizes were determined with Cramer's phi-coefficient (ø). For the relationship to be statistically significant, the p-value had to be below 0.05. The following guidelines were used to interpret the effect size:

ø = 0.1 small effect

ø = 0.3 medium effect

ø = 0.5 large effect

Only when ø ≥0.5 is the effect considered practically significant (Connor-Linton, 2003; Ellis & Steyn; 2003: 51-53; Steyn, 1999: 16; Steyn, 2002: 10 – 15; Adelheid & Pexman, 1999: 43 – 45).

Table 5.15 indicates which characteristics' relation to the e-readiness model criterion is statistically significant and what the size of the effect is. The grey areas marked in the table show where there significant relationships had been found.

Of importance to note is the effect size of 0.60, which indicates that the relation between race and the attention received from the facilitator is of practical importance. Age also played an important role in choices made on the technological simplicity of the course (the effect size is 0.57). The effect size of 0.55 indicates an important relationship between age and the choice to work at their own pace. Of greatest importance is the effect that race had in regard to having enough time and resources to complete activities, namely 0.70.

5.3.4.5.1 Discussion of the statistically significant relationships between the characteristics of the learner group and the Human Resource Dimension (see Table 5.15 and Appendix K)

The criteria with significant relationships have been listed in Appendix K. Specifically the male respondents felt that they received satisfactory attention from the course facilitator.

The 18–30 year-old respondents had the biggest influence on the relationship between age and the Human Resource Dimension's criteria. There was a particularly strong relationship between this group and the belief that they are good at taking content apart, analyzing and reconstructing it.

Of practical significance was the relationship between race and the quality of the attention they received. Most of the Africans and whites were satisfied with the attention, but from the Coloured respondents (although only three) one felt strongly that it was not satisfactory. The Indians were almost equally divided in being satisfied or dissatisfied with the attention. Overall, most of the various races were satisfied with the criterion, with African respondents having the biggest influence on the relationship.

The respondents who had done none to one e-learning course had the biggest influence on agreeing that their thinking abilities have been determined beforehand, followed by the respondents with experience of more than six e-learning courses.

5.3.4.5.2 Discussion of the statistically significant relationships between the characteristics of the learner group and the Technology Dimension (Appendix K)

There was no significant relationship between the gender and the technology dimensions criteria.

As regards age the eighteen to thirty age group had the biggest influence on the medium effect size of the relationship with the criterion requiring easy access to the e-learning course. Of practical significance was the overall agreement of the learner group that the course was technically simple to use.

The effect size of the significant relationship between race and the technology criterion were all medium, with the African respondents having the biggest influence. Criteria in which the relationships were significant was the easy accessibility of the course; the ease of finding information within the course; and that the delivery system that was chosen was sufficient in meeting their training needs.

As regards the level of experience with e-learning courses, the inexperienced group with experience of fewer than two courses had the biggest influence on two of the technology criteria, followed by the respondents with experience of more than six courses. The criteria with significant relationships was the requirement of the course to be engaging and the necessity to indicate the size of downloadable files.

5.3.4.5.3 Discussion of the statistically significant relationships between the characteristics of the learner group and the Pedagogical Dimension (Appendix K)

Gender had a very small effect on the choice of being able to work at their own pace, with the males dominating agreement with this criterion. The 18–30 year-old age group once again played the biggest role in the significant relationships with the criteria of the Pedagogical Dimension. Of practical significance is the relationship between age and the ability to work at one's own pace.

The response to the criterion followed the same pattern than previous dimensions as regards the choices made by the various race groups. The African group had the biggest influence, followed by whites, then Indians. There was a practically significant relationship between race and the requirement to have enough time and resources to complete activities. Only seven of the 215 respondents disagreed with this criterion.

As regards level of experience, the group with experience of less than one course followed by group with experience of more than six courses had the biggest impact on two criteria, namely providing useful online instruction to learners in the use of their time and receiving relevant and timely feedback.

5.3.4.5.4 Discussion of the statistically significant relationships between the characteristics of the learner group and the Organisational Dimension (Appendix K)

There was only one significant relationship between the learner group, particularly the race distribution and the attitude towards self-study by computer. It followed the same pattern as previously, with the African learner group having the biggest influence on the relationship.

Table 5.15 Statistically significant relationship between the characteristics of the learner group and the four e-readiness model dimensions

The Human Resource Dimension												
Criterion (abridged)	**Gender**			**Age**			**Race**			**E-learning experience**		
	Chi -square	**P-value (≤.05)**	**Phi-coefficient**	**Chi -square**	**P-value (≤.05)**	**Phi-coefficient**	**Chi -square**	**P-value (≤.05)**	**Phi-coefficient**	**Chi -square**	**P-value (≤.05)**	**Phi-coefficient**
I have been tested to determine whether I possess the right thinking abilities	1.75	0.62	0.08	27.03	0.00	0.34	8.93	0.70	0.19	18.70	0.02	0.29
I am ready to start the course, my fears have been addressed	1.24	0.74	0.07	16.35	0.06	0.26	11.54	0.48	0.22	13.89	0.12	0.25
The computer skills I need were described and tested	2.12	0.54	0.09	19.63	0.20	0.29	4.59	0.97	0.14	8.77	0.45	0.20
I learn better by active participation with other learners	2.39	0.49	0.10	8.00	0.53	0.18	16.55	0.16	0.27	11.81	0.22	0.24
I am good at taking content apart, analysing it and putting it together again	1.19	0.75	0.07	50.87	0.00	0.47	5.53	0.93	0.15	10.41	0.31	0.22
I know how to learn and make use of several learning methods	1.94	0.58	0.09	23.17	0.00	0.31	6.50	0.88	0.16	13.03	0.16	0.24

Criterion	Gender			Age			Race			E-learning experience		
	Chi -square	P-value (≤.05)	Phi-coefficient	Chi -square	P-value (≤.05)	Phi-coefficient	Chi -square	P-value (≤.05)	Phi-coefficient	Chi -square	P-value (≤.05)	Phi-coefficient
I like learning on my own and can stick to a study plan	1.81	0.61	0.08	14.47	0.10	0.24	8.51	0.74	0.19	13.65	0.13	0.25
I approach new learning experiences with an open mind	2.10	0.55	0.09	10.87	0.28	0.21	4.42	0.97	0.13	6.61	0.67	0.17
The attention I received from the course facilitator is satisfactory	14.47	0.00	0.24	7.76	0.55	0.18	85.38	0.00	0.60	13.42	0.14	0.25
I have been prepared for the course and am convinced of its benefits	0.98	0.80	0.06	9.42	0.39	0.20	21.66	0.04	0.30	9.40	0.40	0.21
I have been exposed to computer learning awareness sessions and feel I had enough time to get used to e-learning	2.24	0.52	0.09	9.42	0.39	0.20	16.29	0.17	0.26	14.87	0.09	0.26
I was allowed enough privacy to test the course in order to get used to it	4.35	0.22	0.13	23.03	0.00	0.31	41.47	0.00	0.42	6.59	0.67	0.17
The necessary pre-knowledge needed has been determined beforehand	1.66	0.64	0.08	17.77	0.03	0.27	14.08	0.29	0.24	12.38	0.19	0.24

Criterion	Gender			Age			Race			E-learning experience		
	Chi -square	P-value (≤.05)	Phi-coefficient	Chi -square	P-value (≤.05)	Phi-coefficient	Chi -square	P-value (≤.05)	Phi-coefficient	Chi -square	P-value (≤.05)	Phi-coefficient
The Technology dimension												
The computer course engaged me	0.64	0.88	0.05	10.07	0.34	0.21	11.97	0.44	0.23	18.28	0.03	0.29
Accessing the course is easy and simple	0.82	0.84	0.05	37.16	0.00	0.40	40.70	0.00	0.42	11.01	0.27	0.22
The navigation buttons look the same	1.23	0.74	0.07	9.08	0.42	0.19	4.34	0.97	0.13	5.45	0.79	0.16
The hyperlinks indicate where they will lead	1.66	0.64	0.08	8.19	0.51	0.19	2.36	0.99	0.10	2.79	0.97	0.11
The sizes of downloadable files are indicated	1.06	0.78	0.07	9.31	0.40	0.21	17.40	0.13	0.29	17.64	0.04	0.30
The course was technically simple to use	3.23	0.35	0.11	75.98	0.00	0.57	5.86	0.92	0.16	5.20	0.81	0.15
The course has the ability to assess and allow for feedback	0.12	0.98	0.02	5.02	0.83	0.14	5.87	0.92	0.16	4.14	0.90	0.14

Criterion	Gender			Age			Race			E-learning experience		
	Chi -square	P-value (≤.05)	Phi-coefficient	Chi -square	P-value (≤.05)	Phi-coefficient	Chi -square	P-value (≤.05)	Phi-coefficient	Chi -square	P-value (≤.05)	Phi-coefficient
The Technology Dimension												
The course has an index and sitemap	0.37	0.94	0.04	11.92	0.21	0.23	37.36	0.00	0.40	10.23	0.33	0.22
The training delivery system chosen met my thinking and training needs	1.39	0.70	0.07	9.98	0.35	0.21	39.30	0.00	0.42	6.51	0.68	0.17
The Pedagogy Dimension												
The computer course was sensitive to my age, race, gender and culture	2.80	0.42	0.11	20.19	0.01	0.30	6.11	0.91	0.16	8.25	0.50	0.20
The course allowed me to work independently	2.97	0.39	0.11	13.49	0.14	0.24	2.92	0.99	0.11	2.74	0.97	0.11
I was allowed to make use of my own work experiences	3.62	0.30	0.06	2.88	0.16	0.23	16.54	0.16	0.27	8.20	0.51	0.19
The course fulfilled my need to be efficient at work	1.29	0.73	0.07	3.52	0.94	0.12	32.24	0.00	0.38	10.81	0.28	0.22

Criterion	Gender			Age			Race			E-learning experience		
	Chi -square	P-value (≤.05)	Phi-coefficient	Chi -square	P-value (≤.05)	Phi-coefficient	Chi -square	P-value (≤.05)	Phi-coefficient	Chi -square	P-value (≤.05)	Phi-coefficient
The course fulfilled my need to collaborate and discuss the work	3.80	0.28	0.13	5.92	0.74	0.16	17.93	0.11	0.28	10.67	0.29	0.23
The physical learning environment was conducive to my learning	1.27	0.73	0.07	5.91	0.74	0.16	39.41	0.00	0.42	6.98	0.63	0.18
Useful online instruction was given on how to use my time	0.36	0.94	0.04	8.72	0.46	0.19	21.65	0.04	0.31	17.26	0.04	0.28
The course allowed different routes one can follow	2.34	0.50	0.10	7.86	0.54	0.18	27.00	0.00	0.35	3.40	0.94	0.12
The Pedagogy Dimension												
The content was relevant and appropriate to my job	3.00	0.39	0.11	9.07	0.43	0.20	30.20	0.00	0.37	5.91	0.74	0.16
The e-learning course was easier than previous learning experiences	0.59	0.89	0.05	14.36	0.11	0.25	8.00	0.11	0.28	12.29	0.19	0.24

Criterion	Gender			Age			Race			E-learning experience		
	Chi -square	P-value (≤.05)	Phi-coefficient	Chi -square	P-value (≤.05)	Phi-coefficient	Chi -square	P-value (≤.05)	Phi-coefficient	Chi -square	P-value (≤.05)	Phi-coefficient
The computer course provided me with enough opportunity to make my own learning decisions	0.84	0.84	0.06	8.28	0.50	0.19	8.19	0.76	0.19	8.59	0.47	0.20
I was allowed to work at my own pace	8.28	0.04	0.19	69.00	0.00	0.55	9.65	0.64	0.20	6.34	0.70	0.17
I was comfortable with the course design and knew what was expected of me	1.75	0.62	0.08	26.47	0.00	0.34	4.23	0.97	0.13	7.30	0.60	0.18
I received relevant and timely feedback	4.93	0.17	0.15	22.03	0.00	0.31	20.74	0.05	0.30	19.98	0.01	0.31
I had enough time and resources to complete activities	2.47	0.48	0.10	38.23	0.00	0.42	108.28	0.00	0.70	5.06	0.82	0.15
The Organisational Dimension												
I am positive towards e-learning and my colleagues and managers support it as a good thing	1.66	0.64	0.09	12.04	0.21	0.23	36.79	0.00	0.40	8.92	0.44	0.20

5.3.4.5.5 Discussion of the responses of the e-learning facilitator and e-learning manager

As in the case of employees, a questionnaire for facilitators of e-learning and e-learning managers was also completed to assist in determining the overall e-readiness of the organisation. Both were interviewed after completion of the questionnaire to gain more insight into some of their choices.

In the company used for implementation of the e-readiness model there was only one facilitator of e-learning in the multimedia centre and one group leader specifically tasked with responsibility for e-learning in the company. Both completed a questionnaire.

The company uses two delivery systems of e-learning, namely the multimedia centre and the company intranet for online desktop training. The multimedia centre is open during weekdays from 07:00 to 16:00.

The e-learning facilitator's response

The facilitator of e-learning in the multi-media centre, a white female between 40 and 50 years of age, had facilitated e-learning courses in the centre for many years and assisted learners daily. Her facilitation experience is limited to computer-based CD-ROM format training as presented in the media centre only.

As regards to the Human Resource Dimension, the facilitator indicated that she was positive towards e-learning, had learned from it and was well skilled in managing the course administration software. However, she felt that although she had no concerns about technical skills, she felt she lacked the necessary subject matter expertise to assist the learners with the various courses, and this was worrying to her.

The feedback provided on the Pedagogical Dimension supports the researcher's audit findings that the courseware does not provide any opportunity for learners to be introduced to each other and communicate or collaborate online whilst learning. She agreed that real-world problems were used in the training and with the fact that information was readily available; however, she disagreed on the efficient use of instructional processes. Although the general tone, look and feel of the courses were acceptable, she mentioned that the courses were outdated and were not updated to keep track with changes in the particular subject matter field. The courses were not easily modifiable and learners did not undergo any reading, writing or language skills tests before they started the course.

Regarding the Organisational Dimension, the positive results included the fact that learners register for the course and that their course results were password-protected, ensuring security around assessments. The direct supervision of the facilitator also assisted in ensuring proper security measures during the course. Various subject matter experts had access to courses, yet they had never been updated. The use of the media centre could also improve as all the computers were not fully utilised at all times.

The e-learning manager's response

The e-learning manager was a white male between 30 and 40 years of age who had experience in a wide range of e-learning delivery systems. The feedback received from the manager indicated that most of the required criteria under the Organisational Dimension were complied with, except for the online guidelines as regards netiquette, the matter of where to obtain technical assistance and the sensible use of online time. Furthermore, the courses were presented in this particular media centre only and nowhere else on other sites of the company.

5.4 CONCLUSION

In this chapter, the researcher developed and verified an e-readiness model. Its use was tested by implementing it in a workplace. The process included the design and verification of an audit tool and stakeholder questionnaires. The result of the audit indicated that the e-readiness model does add value in determining a company's e-readiness, especially when used in conjunction with stakeholder questionnaires, as it supplies answers about the context in which the audit needs to be interpreted.

In the next and concluding chapter the whole research process will be summarised, conclusions will be discussed, constraints highlighted and recommendations made for future research.

CHAPTER 6

SUMMARY, CONCLUSION AND RECOMMENDATIONS

6.1 INTRODUCTION

In the previous chapter the progress and results of the empirical research project were discussed. This chapter is a reflection on whether the research question has been answered, namely:

How is a quality distance training event for the various employees and the employer in their different settings to be ensured.

A summary will be given to reflect on whether the research objectives have been met and the purpose of the study, namely to develop a holistic electronic readiness model in answer to the research question, has indeed been fulfilled as planned. Conclusions of the research will also be given, limitations discussed and suggestions for possible further research opportunities provided.

6.2 SUMMARY

In answer to the research question the researcher attempted to design an e-readiness model to ensure that e-learning events as applied in the different settings of the workplace is a positive experience for both the employee and the employer.

Objective one: to explore the research title in a literature review

In order to design the model the various influencing factors that could affect the e-learning event needed to be captured. The influencing factors were identified through exploring the concepts in the research title, namely distance education, learning and its meaning in the current Information Age, and the electronic delivery of training, and a literature review was done on each.

The concept of "distance education" and the various theories referring to its unique characteristics and the requirements that need to be met in order to have a successful distance education event were discussed in Chapter 2. Chapter 3 explored Constructivism as learning epistemology of choice in the Information Age, whilst in Chapter 4 the

various elements to consider when using electronic delivery of the learning event were discussed.

Objectives two to seven: The compilation of an e-readiness model, its verification and its application in a workplace by following the various phases of the research project.

In order to compile and test the usability of an e-readiness model, the following steps were taken:

- An initial conceptual framework model, including all the main identified influencing criteria, has been compiled from the literature review.
- The model has been verified by using a questionnaire collecting quantitative as well as qualitative data from participants in an internet instructional technology forum.
- Data analysis was performed and the conceptual framework model changed in accordance with findings.
- The model was further developed into an audit tool incorporating specific elements necessary to comply with the requirements of the e-readiness model.
- Verification of the audit tool in a specific workplace was done by using the input from a workplace trainer focus group.
- Finally the model was applied in the media centre of a particular workplace to determine the e-readiness of the workplace in that particular context.

6.3 CONCLUSIONS OF THE RESEARCH

6.3.1 The main conclusions of the literature study

- The concept of "distance education" is synonymous with the concept of electronic delivery of learning and it is widely used as such in the education and training arena.
- Delivery of a learning event through distance education has unique characteristic that separates it from classroom learning events and one should take note of and plan for these characteristics if one still wants to meet the learning outcomes and have a successful learning event.

- Although there are various distance education theories they all share common trends that need to be considered when planning for an e-learning event, namely:
  - * transactional distance creates a learning challenge and special arrangements need to be made with the delivery of the learning event in order to overcome the distance;
  - * separation between the educator and learner creates special circumstances that need to be addressed as direct mediation is no longer possible; and
  - * the lack of direct communication with the educator and other learners creates a learning challenge as collaboration and communication are not as easy as in a class room setting;
- The Information Age requires a Constructivist epistemological approach in order for employees and employers to be sustainable as the global business arena is highly competitive and economically challenging.
- The employees need to learn how to solve problems creatively and efficiently, and to do that they need to learn to think differently. To develop this skill a learning event incorporating Constructivist methodologies should be used.
- The attributes of Constructivism, namely active participation, the intentional and meaningful construction of knowledge, authenticity and the cooperative nature in which learning takes place, possess the ability to overcome the challenges of distance education
- The blanket (general) application of a Constructivist epistemology may not always be appropriate in all workplace contexts as each individual and groups within an organisation have specific needs at any given time. Combinations of a Constructivist and Objectivist epistemologies in the same learning event may be necessary at times to ensure learner satisfaction.
- The Constructivist pedagogical approaches have specific strategies and pedagogical characteristics that separate them from the Objectivist (Behaviourist) epistemologies.
- There is a vast array of electronic delivery systems available to deliver learning events, making this delivery tool versatile and able to accommodate most education and learning needs.

- Technological delivery of learning has specific disadvantages that need to be planned for or else they will impact negatively on the learning event.
- Delivering of a learning event by electronic means must be carefully considered for the pedagogical value that it will add. It stays a tool for delivery and should not be chosen automatically for the advantages that it possesses.
- The successful electronic delivery of a learning event needs careful and meticulous planning and control of a multitude of influencing factors.
- There are common trends among the requirements for distance education, constructivism and electronic delivery of learning events that lend themselves to capturing in a e-readiness model. The necessity for collaboration and communication to overcome transactional distance for example is compatible with the Constructivist pedagogy requiring the same. Electronic delivery of courses creates transactional distance but solves it through enabling communication and cooperation.
- There is a multitude of factors influencing the learning event, most of which should be planned for and captured in a conceptual model, so that coordination and management of the learning event can be ensured. Specific strategies should be implemented before rolling out an e-learning event.
- Capturing most of the influencing factors in a conceptual framework enables the organisation to ensure a quality learning event.

6.3.2 The main conclusions of the research project

The research project followed four different phases (see page 169). The conclusions from phase one have been discussed above. Set out below are the conclusions of phases two to four of the empirical investigation.

Phase two: Compiling the dimensions of the e-readiness model

- The various dimensions and all the criteria – except for one, namely the need for face-to-face contacts sessions – underlying each dimension have been accepted as necessary by the majority of participants.

- From the four dimensions and the total of 76 criteria, the following were considered most important as the majority of the participants either agreed or strongly agreed that they were a requirement:-
    - The educator must have the necessary e-learning skills
    - The educator must have the correct e-learning behaviours
    - Learners must be allowed enough time to change and adapt to the e-learning event.
    - Learners must have the necessary e-learning skills.
    - The technological infrastructure must be able to carry the load
    - There educationist must be a helpline for technical support
    - There must be consistency in the appearance of the navigation bars
    - The e-learning event must make use of the most appropriate delivery system
    - The e-learning event must have appropriate activities
    - Time online must be appropriate to and supportive of the learning process
    - Appropriate time and resources must be allowed for activities
    - The course must comply with legal requirements
    - The course must have enough support staff
    - There must be a positive organisational culture of online studying
- There were differences in the choices made by the various categories of participants for all the dimensions. The years of experience, role and relationship of the participant in regard to e-learning as well as the context in which the participant used e-learning had an influence in the choices made. However, the effect sizes in all instances were only small to medium. There were no relationship of practical significance amongst the various categories and choices made.

Phase three: The design of an e-readiness audit instrument

An e-readiness audit instrument was designed and verified using the input from a workplace trainer focus group. The focus group of occupational trainers agreed with all the elements chosen to be presented as evidence when auditing an e-learning event. Minor changes were made in the compilation of evidence.

Phase four: – Implementation of the e-readiness model

During this phase two processes were followed, namely a physical audit of the e-learning courses by the researcher as well as an evaluation of the courses with questionnaires completed by the learners (employees), facilitator and manager. The interpretation of the audit results was done in combination with or with consideration of the results of the questionnaires.

- Questionnaires were designed and verified with a pilot study, to be used in conjunction with the e-readiness audit instrument.
- A physical audit was completed on the multimedia centre of a work place, whilst the learners who used the centre completed questionnaires. The most significant result of the physical audit was the fact that the courses used in the media centre all followed a behaviourist approach. The courses scored very low against the requirements of the Constructivist e-readiness audit tool used.
- The company that was assessed possessed the technological ability to exploit the current infrastructure to a greater extent. Therefore they scored highest in this part of the audit, namely 65%.
- However, the courses did not consider the individual needs of the learners and did not use a Constructivist pedagogy, while there was also no clear strategy to optimise the e-learning event on the organisational level.
- The expectation was that the learners would also rate the e-learning events low but their scores indicated the exact opposite of what was expected. Despite indications that the learners are inexperienced e-learning users and did not have the necessary understanding of computer terminology used in the questionnaires, the majority agreed that the requirements set out by the e-readiness model have been met.
- The learner group indicated the following requirements as most important because most of the individuals either agreed or strongly agreed with them:
    - I approach new learning experiences with an open mind.
    - I am good at taking content apart, analysing it and putting it together again.
    - I was allowed enough privacy to test the course in order to get used to it.

* The navigation buttons look the same
* The course has the ability to assess and allow for feedback
* The hyperlinks indicate where they will lead
* The course fulfilled my need to be efficient at work.
* I was allowed to make use of my own work experiences
* I received relevant and timely feedback.

- The gender, age, race and e-learning experience of the learners did have an effect on some of question choices they made, most of which ranged between a small and a medium effect. The following relationships were of a practical significance because the Phi coefficients (ø) were above 0,5:-
  * Race (ø = 0.60) played a significant role in the importance of the attention received from the course facilitator.
  * Age had a significant effect (ø = 0.57) on the importance of the course as technologically simple.
  * Age also had a significant role (ø = 0.55) to play as regards the importance of being allowed enough time to work at one's own pace.
  * Of great practical significance (ø = 0.70) was the importance that was attached to enough time and resources to complete activities in relation to race.
- The feedback from the facilitator confirmed the results of the physical audit as she agreed that the shortcomings in meeting the requirements of the e-readiness model existed.

6.4 CONSTRAINTS ON AND LIMITATIONS OF THE STUDY

The study was conducted in the South African context. It focused on one form of computer-assisted distance education (a media centre) that is utilised in a workplace, namely independent computer assisted training. Due to the specific type of distance education chosen for this research, the findings may not be directly transferable to any other type of distance education used in other workplaces in South Africa. Furthermore, the particular company chosen for this study made use of other e-learning delivery

systems of which the media centre was but one. The results can thus not be transferred to the company's compliance with e-readiness as a whole.

The study was done in a global chemical corporate industrial environment, which differs from other corporate environments as regards the male domination of employees as well as the fact that mostly technical and engineering professions are found in such an industry. This may affect the transferability of the proposed model to other workplaces.

An international internet participant group verified the initially compiled conceptual framework. This may not be transferable to the South African context. Furthermore, the participants of this group are not all employees directly involved in workplace e-learning. Some are distance education and information technology specialist whose understanding of training generally and/or specifically may be limited. This may have had a detrimental effect on the important issues that should be included in or excluded from the training model, but it can also have a beneficial effect in providing a multi-perspective approach to e-learning, which is one of the aims of this study.

Employees included were from various job categories, including the technical, the administrative and the engineering field. They had varied educational and cultural backgrounds and their ages differed. Differences in their respective focuses in regard to subject fields, as well as the predominantly male representation and cultural differences, may have had a negative impact on the validity and transferability of information gathered. Most of the participants (60%) were African and as the questionnaire was in English (their second language), one can assume that language barriers as well as a lack of computer experience (46% was doing e-learning for the first time) caused misinterpretation of questions asked.

Lastly, the large number of courses available in the multimedia centre made it impractical to evaluate each and every one. Some were not available due to technical problems. This limited the results to only the courses observed, and transferral of results to all courses may not be appropriate.

6.5 RECOMMENDATIONS AND SUGGESTIONS FOR FURTHER RESEARCH

The following suggestions may improve on the research already done and may serve as opportunities for further research, thus improving the e-learning practices in the workplace, particularly in South Africa:

- A South African e-learning specialist group should be considered to determine e-readiness requirements and particularly to focus on the e-learning habits and needs in a South African context. The "digital divide" is a well-known concept, indicating that the needs of third-world countries differ when compared to those of first-world countries. There may be differences in the way one should approach e-readiness, considering that the current workplace consists of a mixture of people having, and not having, access to computers (Digital divide network, 2006).
- The e-readiness model that was designed applied requirements generically, irrespective of which e-learning delivery system is used. Further research needs to be done to determine which requirements are appropriate to each delivery system.
- The model did not weigh each criterion. Further research can determine which criteria are more important than others.
- More research is needed to determine how many of the requirements can be ignored or left out before it will impact negatively on the end result. In other words, to determine what the minimum number of requirements is and exactly what these requirements are, in order to ensure a successful e-learning event.
- The study needs to be extended to other workplaces that are more diverse as the company used is male dominated and workers are mostly involved in the technical field.
- Due to the diverse nature of the workplace, research needs to be done to determine whether the needs and requirements for e-readiness are the same across all groups or whether there are marked differences that should be planned for when attempting an e-learning event.
- Further research should consider language barriers and use questionnaires in participants' first language to ensure understanding.

- Explanation of computer terminology before the questionnaire is completed is advisable as not all respondents may be familiar with the concepts.
- There is also much room for further refinement of the audit instrument as well as the questionnaires, something that can be done through further research.

6.6 SIGNIFICANCE OF THE STUDY

This study is significant in that the e-readiness model designed and verified can be used on the operational level so that the average workplace trainer and manager with limited training knowledge can use it. The use of the model will limit unnecessary spending or wasting of financial resources as it will provide employers with the knowledge required to eliminate purchasing ineffective computer training programmes, and enable them to better plan their in-house computer training system. This can be done in four ways, namely by using it:

- as a guideline to decide whether or not to embark on e-learning;
- as a checklist (strategy) to plan for e-learning and determine readiness of workplaces for e-learning;
- to evaluate ongoing e-learning in order to determine any shortcomings and remedy them;
- after the e-learning event to determine the success of the event; and
- as a tool for the instructional designer, as a guide when designing new distance education programmes to ensure that they address all the needs of the learner, the facilitator and the organisation providing the training event.

The financial constraints and loss of reputation of training providers due to the ineffective use of technology for distance education will be reduced as the model will assist the provider with clear elements that should be managed to ensure a quality learning event. The model will also ensure that the employee's learning needs will be satisfied, considering his need to construct meaning in his working world through learning new skills.

Lastly, the study provides room for uniqueness in terms of context and type of learner. There is room for flexibility and sensible interpretation of results, based on the level of

satisfaction obtained from the learner evaluations. The holistic approach followed prevents a one-sided approach and allows for various angles to assist the employer to make the best possible decision considering all the circumstances.

6.7 CHAPTER CONCLUSION

This chapter summarised the most relevant conclusions of the various phases of the research project. A workable e-readiness model with an audit instrument and stakeholder questionnaires have been designed and tested. This is a practical and usable point of departure for any vocational educationist to use when planning, diagnosing problems of or evaluating an e-learning event.

BIBLIOGRAPHY

ABERNATHY, D.J. 1998. The WWW of distance learning: who does what and where? *Training &development*, 52(9):28–32, 34–36, 38, 40–41, Sept.

ADELHEID, A.M.N. & PEXMAN, P.M. 1999. Presenting your findings: a practical guide for creating tables. Washington: American Psychological Association. 157 p.

ALDRICH, C. 2000. Customer-focused e-learning: the drivers. *Training & development*, (54)8:34-38, August.

ANDERSON, T. 2002. Is e-learning right for your organization? On the learning circuits website. [Web:] http://www.learningcircuits.org/2002/jan2002/anderson.html [Date of access: 17 January 2006].

ANON. 1997. Published interview with Peter F. Drucker – Seeing things as they really are on the Forbes.com website. [Web:] http://www.frobes.com/forbes/1997/0310/5905122a_print. html [Date of access: 4 April 2006].

ANON. 1998. Don't redesign for disaster: some tips from an expert. Patient-focused-care-and-satisfaction, 6(4):43, April.

ANON. 2000. Web-based simulation training – the next quantum leap in distance education. IT training, 2:18.

APEC READINESS INITIATIVE. 2005. E-commerce readiness assessment guide on the Global Internet Policy Initiative E-readiness guides website. [Web:] http://www. internetpolicy.net/readiness/readiness_guide_5.pdf [Date of access: 14 January 2006].

AYDIN, C.H. & TASCI, D. 2005. Measuring readiness for e-learning: reflections from an emerging country on the Journal of educational technology and society website. [Web:] http://www.ifets.info/journals/8_4/22.pdf [Date of access: 15 January 2006].

BARRON, A. 1998. Designing web-based training. British journal of educational technology, (29)4:355-370.

BARRON, T. 1999. Harnessing online learning. Training & development, (53)9:28-33, September.

BARRON, T. 2000. Getting IT support. Training & development, 12:32-35, December.

BEAN, M. 2004. Are you ready for e-learning? Assessing e-learning readiness on the Mediapro website. [Web:] http://mediapro.com/html/resources/news1-vol5-01.htm [Date of access: 17 January 2006].

BEDNAR, A.K., CUNNINGHAM, D., DUFFY, T.M. & PERRY, J.D. 1992. Theory into practice: Do we link? (In Duffy, T.M. & Jonassen, D.H., eds. Constructivism and the technology of instruction. Hillsdale, N.J.: Erlbaum. p. 45–55.)

BHALALUSESA, E. 1999. The distance mode of learning in higher education: the Tanzanian experience. Open learning, 14(2):14–23, June.

BISCHOFF, R.W., BISCONER, S.W., KOOKER, B.M. & WOODS, L.C. 1996. Transactional distance and interactive television in the distance education of health professionals. American journal of distance education, 10(3):4–19.

BLACK, D. 1998. Live and online: a WBT primer. Training-and-development, 52(9):35–36, Sept.

BODZIN, M. & PARK, J.C. 1999. An online enquiry instructional system for environmental issues. Meridian a middle school computer technologies journal, 2(2). [Web:] http://www.ncsu.edu/meridian/jul99/coastal/ [Date of access: 22 March 2006].

BOETTCHER, J.V. 1998. Learning theories on the Virginia Community College online resources for studying website. [Web:] http://vccslitonline.cc.va.us/usingweb/bckgrnd.htm [Date of access: 20 March 2006].

BOGER-MEHALL, S.R. 1997. Cognitive flexibility theory: implications for teaching and teacher education on the Martin Ryder website. [Web:] http://carbon.cudenver.edu/~mryder/ itc_data/idmodels.html [Date of access: 22 March 2006].

BOLMAN, L.G. & DEAL, T.E. 1997. Reframing organizations. 2nd ed. San Francisco, Calif.: Josey-Bass. 424 p.

BOROTIS, S. & POULYMENAKOU, A.. 2004. E-learning readiness components: key issues to consider before adopting e-learning interventions on the Athens University of Economics and Business website. [Web:] http://www.eltrun.gr/papers/eLReadiness_ ELEARN2004.pdf [Date of access: 15 January 2006].

BOSHIER, R., WILSON, M., BURNHAM, B. & REEVES, P. 1999. Adult education adrift in a net: Making waves or clutching a lifering? [Web:]

http://www.edst.educ.ubc.ca/aerc/ 1999/99symp_boshier.htm [Date of access: 15 April 2006].

BRANSFORD, D.J., SHERWOOD, R.D., HASSELBRING, T.S., KINZER, K.C. & WILLIAMS, S.M. 1990. Anchored instruction: Why we need it and how technology can help. (In Nix, D. & Spiro, R., eds. Cognition, education, multimedia. Exploring ideas in high technology. Hillsdale, N.J.: Erlbaum. p. 115–138.)

BROADBENT, B. 2005. Tips to help decide if your organization is ready for e-learning on the Islamic center for distance education website. [Web:] http://icde.net/en/arshive/articles/ 012.htm [Date of access: 2 January 2006].

BROOKFIELD, S. 1986. Andragogy: alternative interpretations and applications summarized from understanding and facilitating adult learning. [Web:] http://archon. educ.kent.edu/~nebraska/curric/ttim1/artsum.html [Date of access: 21 March 2006].

BUDHIRAJA, R. & SACHDEVA, S. 2005. E-readiness assessment on the department of information technology, ministry of communications and information technology (Government of India) website. [Web:] http://www.mit.gov.in/eg/ereadiness.doc [Date of access: 3 October 2005].

CAGNÉ, R.M. 1987. Foundations in learning research. (In Cagné, R.M. & Glaser, R., eds. Instructional technology: foundations. Hillsdale, N.J.: Erlbaum.)

CAMARGO, A., HYDE, L. & WHIGHAM, C. 2006. Andragogy. [Web:] http://claweb. cla.unipd.it/home/cwhigham/cam_hy_whig/andragogy.htm [Date of access: 21 March 2006].

CAMBRIDGE ADVANCED LEARNERS' DICTIONARY. 2004 [Web:] http://dictionary. cambridge.org/results.asp?searchword=holistic&image.x=51&image. y=5 [Date of access: 3 October 2005].

CARBONELL, L. 2004. Learning theory on the e-coach website. [Web:] http://www.my-ecoach.com/idtimeline/learningtheory.html [Date of access: 20 March 2006].

CARLSON, R. 1989. Malcolm Knowles: apostle of andragogy on the instructional technology global resource network website. [Web:] http://www.ittheory.com/knowles.htm [Date of access: 21 March 2006].

CASEY, E. 2002. Using case-based reasoning and cognitive apprenticeship to teach criminal profiling and internet crime investigation on the Forensic solutions website. [Web:] http://www.corpus-delicti.com/case_based.html [Date of access: 21 March 2006].

CENTER FOR ONLINE ADDICTION. 2004. Training recovery consultation. [Web:] http://www.netaddiction.com/ [Date of access: 14 April 2006].

CHAPNICK, S. 2000. Are you ready for e-learning? On the Learning circuits website. [Web:] http://www.learningcircuits.org/2000/nov2000/Chapnick.htm. [Date of access: 16 January 2006].

CHEN, Y.J. & WILLITS, F.K. 1998. A path analysis of the concepts in Moore's theory of transactional distance in a videoconferencing learning environment. Journal of distance education, 13(2):51-65, Autumn.

CHEN, Y.J. & WILLITS, F.K. 1999. Dimensions of educational transactions in a videoconferencing learning environment. The American Journal of Distance Education, 13(1):45 – 59.

COLE, M. & WERTSCH, J.V. 2001. Beyond the individual-social antimony in discussions of Piaget and Vygotsky on the Massey University website. [Web:] http://www.massey.ac. nz/~alock/virtual/colevyg.htm [Date of access: 1 March 2006].

COLLEGE BOARD ACCUPLACER. 2005. The Accuplacer online student guide. [Web:] http://cpts.accuplacer.com/docs/StudentGuide.html [Date of access: 16 January 2005].

COLLEGE OF HEALTH PROFESSIONS. 2000. Lower back pain on the School of Nursing Wichita State University website. [Web:] http://nursing.twsu.edu/clp/backpain_preview/ index.htm [Date of access: 21 March 2006].

COLLINS, A., HAWKER, J. & CARVER, S.M. 1991. Cognitive apprenticeships for disadvantaged children on the Education and Development Centre website. [Web:] http://www.edc.org/CCT/ccthome/reports/tr10.html [Date of access: 21 March 2006].

COLLINS, M. 1999. I know my instructional technologies: It's these learners that perplex me! *American journal of distance education,* (13)1: 8-23.

COLUMBIA CENTRE FOR NEW MEDIA IN TEACHING AND LEARNING. 2004. QMSS e-lessons. Quantitative methods in social sciences samples and sampling on the Columbia center for new media teaching and learning website. [Web:] http://ccnmtl.columbia. edu/projects/qmss/samp_type.html [Date of access: 7 July 2005].

CONÈ, J. 2000. Getting started with e-learning. *Training & development*, 4:62-64, May.

CONNOR-LINTON, J. 2003. Chi square tutorial. [Web:] http://www.georgetown. edu/faculty/ballc/webtools/web_chi_tut.html [Date of access: 3 June 2006].

CONVERGYS. 2006. Converges outthinking outdoing. [Web:] http://www.convergys. com/employeecare_learning.html [Date of access: 27 April 2006].

CONWAY, J. 1997. Educational technologies effect on models of instruction on the University of Delaware website. [Web:] http://copland.udel.edu/~jconway/EDTST666.htm [Date of access: 21 March 2006].

COSTA RICAN HIGH TECHNOLOGY ADVISORY COMMITTEE FOUNDATION (CAATEC). 2002a. What is educationist-readiness? [Web:] http://www.caatec.org/ ereadiness/asps/goto.asp?pag=ereadiness.htm&lang=eng_ [Date of access: 4 October 2005].

COSTA RICAN HIGH TECHNOLOGY ADVISORY COMMITTEE FOUNDATION (CAATEC). 2002b. ICT for competitiveness of micro, small and medium enterprises (msmes) in central America – e-readiness and e-training. [Web:] http://www. caatec.org/caatec/asps/ goto.asp?pag=rutacritica.htm&lang=eng [Date of access: 3 October 2005].

CRONBACH, L. & SNOW, R. 2002. Aptitude-treatment interaction. [Web:] http://tip.psychology.org/cronbach.html [Date of access: 30 December 2002].

CRONJE, J. 2000. Paradigms lost towards integrating objectivism and constructivism. On the ITFORUM website. [Web:] http://it.coe.uga.edu/itforum/paper48/paper48.htm [Date of access: 17 March 2006].

CRONJE, J. 2002. Interactive Internet using the Internet to facilitate co-operative distance learning. [Web:] http://hagar.up.ac.za/catts/abc/rbo96.html [Date of access: 19 June 2002].

CUNNINGHAM, P.S. 1994. Teacher knowledge, cognitive flexibility and hypertext: case-based learning and teacher education on the Martin Ryder website. [Web:] http://music.utsa. edu/tdml/ conf-II/II-Cunningham.html [Date of access: 22 March 2006].

DABBAGH, N. 2004a. Infored consent a case study on the Nada Dabbagh website. [Web:] http://itdev.gmu.edu/projects/ollbook/track/html/index.html [Date of access: 22 March 2006].

DABBAGH, N. 2004b. Web-based learning framework on mapping instructional strategies to web features on the Nada Dabbagh website. [Web:] http://mason.gmu.edu/~ndabbagh/ wblg/wblframework.html [Date of access: 22 March 2006].

DABBAGH, N & BANNAN-RITLAND. 2005. Online learning concepts, strategies, and application. Upper Saddle River, N.J.: Pearson Education. 348 p.

DABBAGH, N. 2006. Select instructional models/Theories to develop instructional prototypes on Nada Dabbagh's homepage, George Mason University, Instructional technology program. [Web:] http://classweb.gmu.edu/ndabbagh/Resources/IDKB/models_theories.htm#theorists. [Date of access: 1 March 2006].

DAVEY, K.B. 1999. Distance learning demystified. National forum, 79(1):44-46, Winter.

DEDE, C. 1999. The multiple media difference. TECHNOS, (8)1:16–18, Spring.

DE LISLE, P. 1997. What is instructional design theory? On the ITFORUM website. [Web:] http://hagar.up.ac.za/catts/learner/peterdl/ID%20Theory.htm [Date of access: 3 January 2003].

DE VILLIERS, L. 2001. Utilising technology in health sciences education. Health SA interdisciplinary research journal, 6(3):1–27.

De Vos, A.S. 1998. Research at grassroots. Pretoria: Van Schaik. 436 p.

DIGITAL DIVIDE NETWORK. 2006. Welcome to the digital divide network. [Web:] http://www.digitaldivide.net/ [Date of access: 25 July 2006]

DOUGIAMAS, M. 1998. A journey into constructivism. [Web:] http://dougiamas.com/ writing/constructivism.html [Date of access: 20 March 2006].

DRISCOLL, M. 1997. Defining Internet-based and Web-based training. *Performance improvement,* (36)4:5-9, April.

DUCHASTEL, P. 2003a. Prolegomena to a theory of instructional design on the university of Georgia website. [Web:] http://it.coe.uga.edu/itforum/paper27/paper27.html [Date of access: 5 May 2003].

DUCHASTEL, P. 2003b. Building a Theory of Instructional Design. [Web:] http://it.coe.uga.edu/itforum/paper27/paper27b.html [Date of access: 5 May 2003].

Duffy, T.M. & Jonassen, D.H. 1992. Constructivism: implications for instructional technology. (In Duffy T.M. & Jonassen, D.H., eds. Constructivism and the technology of instruction a conversation. Hillside, N.J.: Erlbaum. p. 1–16.)

DUNCAN, C.R., KNAPP, R.G. & MILLE, M.C. 1977. Introductory biostatistics for the health sciences. New York: Wiley. 163 p.

E-BLOGGER. 2006. Create you own blog now – free. [Web:] http://www.blogger.com/start [Date of access: 23 March 2006].

ENGLISH FOR EVERYBODY. 2005. Cambridge proficiency exam. [Web:] http://www.english-online.org.uk/prof/profhome.htm [Date of access: 16 January 2005].

E-LEARNING CENTRE. 2006. Evaluating the effectiveness of e-learning on the e-learning website. [Web:] http://www.e-learningcentre.co.uk/eclipse/Resources/effective.htm [Date of access: 3 January 2006].

E-LEARNING GUILD. 2006. The e-learning guilds online forums. [Web:] http:// www.e-learningguild.com/pbuild/linkbuilder.cfm?selection=fol.41 [Date of access: 23 March 2006].

ELECTRONIC ARTS. 2006. Simcity4. [Web:] http://simcity.ea.com [Date of access: 24 March 2006].

ELLIS, S.M. & STEYN, H.S. 2003. Practical significance (effect sizes) versus or in combination with statistical significance (Pedagogy-values). *Management dynamics,* 12(4):51-53.

ETS CRITERION. 2004. Criterion^{sm} Online writing evaluation. [Web:] http://www.ets.org/portal/site/ets/menuitem.435c0b5cc7bd0ae7015d9510c3921509/?vg

nextoid=b47d253b164f4010VgnVCM10000022f95190RCRD [Date of access: 21 December 2004].

ETS TOEFL. 2004. TOEFL – Test of English as foreign language. [Web:] http://www.ets.org/portal/site/ets/menuitem.fab2360b1645a1de9b3a0779f1751509/?vgnextoid=69c0197a484f4010VgnVCM10000022f95190RCRD. [Date of access: 21 december 2004].

FARREL, J.N. 2000. Long live C-learning. Training & development, (54)9:43-46, September.

FIDISHUN, D. 2006. Andragogy and technology: integrating adult learning theory as we teach with technology on the Middle Tennessee State University website. [Web:] http://www. mtsu.edu/%7Eitconf/proceed00/fidishun.htm [Date of access: 21 March 2006].

FIGUEIRA, E. 2005. Evaluating the effectiveness of e-learning strategies for small and medium enterprises on The KnowNet website. [Web:] http://www.theknownet.com/ict_smes_seminars/papers/Figueira.html [Date of access: 25 January 2005].

FILIPCZAK, B. 1997. Are you wired enough? Training, 34(12):34-39, Dec.

FULL CIRCLE ASSOCIATES. 2006. Full Circle online interaction blog. [Web:] http://www.fullcirc.com/weblog/2004/08/etablishing-intranet-community-of.htm [Date of access: 23 March 2006].

GAGNON, G.W. & COLLAY, M. 2005. Constructivist learning design. [Web:] http://www.prainbow.com/cld/cldp.html [Date of access: 24 January 2005].

Galagan, P.A. 2000. The e-learning revolution. Training & development, 54(12):24-30, December.

GARRISON, D.R. & BAYTON, M. 1987. Beyond independence in distance education: the concept of control. American journal of distance education, 1(3):3-15.

GARRISON, D.R. & SHALE, D. 1987. Mapping the boundaries of distance education: problems in defining the field. American journal of distance education, 1(1):7-13.

GARTNER LEARNING GROUP. 2006. Gglearning.com – Job recruiting - Free diets – Dating tips – Retirement income – Job guides – Buy a domain name. [Web:] http://www. gglearning.com/ [Date of access: 27 April 2006].

GEORGE, J.B. 1995. Nursing theories: the base for professional nursing practice. Englewood Cliffs, N.J.: Prentice Hall. 455 p.

GILBERT, L.S. 1998. Intranets for learning and performance support. (*In* Cahoon, B. & Imel, S., *eds*. Adult learning and the Internet: new directions for adult and continuing education. San Francisco, Calif.: Josey-Bass. p. 15–24.)

GLOBAL LEADER IN CONSTRUCTIVIST EDUCATIONAL TECHNOLOGY. 2006. MicroWorlds EX. [Web:] http://www.microworlds.com [Date of access: 24 March 2006].

GOLDSTEIN, J. 1998. The case for learning styles. *Training and development*, 52(9):36, September.

GROS, B., ELEN, J., KERRES, M., MERRIËNBOER, J. & SPECTOR, M. 1997. Instructional design and the authoring of multimedia and hypermedia systems: does a marriage make sense? *Educational technology*, 37(1):610-615, Jan - Feb.

GUGLIELMINO & ASSOCIATES. 2004. Self directed learning readiness scale. [Web:] http://www.guglielmino734.com/ [Date of access: 21 December 2004].

HALL, B. 2005. FAQs about e-learning on the Islamic center for distance education website. [Web:] http://icde.net/en/arshive/articles/index_articles.htm [Date of access: 15 January 2005].

HANLEY, S. 1994. Essay on constructivism on the University of Maryland website. [Web:] http://www.infrom.umd.edu/UMS+State/UMD-Projects/MCTP/Essays/Constructivism.txt [Date of access: 1 March 2006].

HAPPY NEURON. 2004. Cognitive ability test. [Web:] http://www.happyneuron.com/GBHappyNeuron/cognitive-science/cognitive-ability-test.html [Date of access: 30 December 2004].

HARRY, K. JOHN, M. & KEEGAN, D. 1993. Distance Education: New Perspectives. London: Routledge. 348p.

HARTLEY, D. 2000. All aboard the e-learning train. *Training & development*, 54(7):37-42, July.

HARTLEY, J. 1998. Using principles of text design to improve the effectiveness of audiotapes. *British journal of educational technology*, 19(1):4–16, Jan.

HEILIGHEN, F. 1997. Epistemological constructivism on the principles of cybernetics website. [Web:] http://pespmcl.vub.ac.be/CONSTRUC.HTML [Date of access: 1 March 2006].

HEIN, G.E. 1991. Constructivist learning theory – the museum and the needs of people on the Exploratorium website . [Web:] http://www.exploratorium.edu/IFI/resources/ constructivistlearning.html [Date of access: 1 March 2006].

HILL, J.R. & RAVEN, A.. 2000. Online learning communities: if you build them, will they stay? on the ITFORUM website. [Web:] http://itech1.coe.uga.edu/itforum/paper46/ paper46.htm [Date of access: 16 January 2006].

HILLIARD, V. & Kemp, N. 2000. E-tuition - can it replace "chalk and talk"? IT training, 2:22-24.

HIPWELL, W.W. 2000. Promoting your B-learning investment. Training & development, 9:18-19, September.

HOLMBERG, B. 1977. Distance education: a survey and bibliography. London: Kegan Page. 167 p.

HOLMBERG, B. 1995. The evolution of the character and practice of distance education. Open learning, 10(2):47–53, June.

HUBIAK, S. 1998. Click on to effective training. Safety & health, N9:116-118, September.

HUGHES, J. & ATTWELL, G. 2003. A framework for the evaluation of e-learning on The KnowNet website. [Web:] http://www.theknownet.com/ict_smes_seminars/papers/ Hughes_Attwell.html#H1_0 [Date of access: 6 September 2003].

HUYSAMEN, G.K. 1998. Descriptive statistics for the social and behavioural sciences. 3rd ed. Pretoria: Van Schaik. 103 p.

INMAN, E., KERWIN, M. & MAYES, L. 1999. Instructor and student attitudes toward distance education. *Community college of research and practice*, (23)6:581–591.

INSTRUCTIONAL TECHNOLOGY FORUM. 2005. Instructional Technology Forum. [Web:] http://it.coe.uga.edu/itforum/index.html#Copyright_and_Discussion_Policies-_2006_ [Date of access: 02 January 2005 2005].

ITPRENEURS. 2004. Organization e-learning readiness assessment consultancy. [Web:] http://www.itpreneurs.com/Services/E_learningConsultancy/Organizational_Readiness.htm [Date of access: 21 December 2004].

JOHNSON, A. 2001. Online teaching strategies for effective e-learning. [Web:] http://ouray.cudenver.edu/~aajohnso/kolb/index.html [Date of access: 21 March 2006].

JONASSEN, D.H. 1992. Evaluating constructivistic learning. (*In* Duffy, T.M. & Jonassen, D.H., *eds*. Constructivism and the technology of instruction. Hillsdale, N.J.: Erlbaum. p. 137–138.)

JOHNSON, D.W. & JOHNSON, R.T. 1991. Learning together and alone. 3rd ed. Upper Saddle River, N.J.: Prentice Hall. 260 p.

JONASSEN, D.H. 2001. Welcome to the design of constructivist learning environments (CLEs). [Web:] http://www.coe.missouri.edu/~%7Ejonassen/courses/CLE/index.html [Date of access: 1 March 2006].

JONASSEN, D.H., CARR, C. & YUEH, H. 1998. Computers as mind tools for engaging learners in critical thinking. *Tech trends*, 43(2):24–32, March.

JONASSEN, D.H., HENNON, R.J. & ONDRUSEK, A. 1997. Certainty, determinism, and predictability in theories of instructional design: lessons from science. *Educational technology*, 37(1):27-34, Jan-Feb.

JONASSEN, D.H., PECK, K.L. & WILSON, B.G. 1999. Learning with technology a constructivist perspective. Upper Saddle River, N.J.: Prentice Hall. 234 p.

JONASSEN, D.H. & ROHRER-MURPHY, L. 1999. Activity theory as a framework for designing constructivist learning environments. [Web:] http://www.coe.missouri.edu/~jonassen/courses/CLE/documents/activity.pdf [Date of access: 1 March 2006].

JORDAN, G. 2000. Revolutions in thinking. Sharing resources between academia and the commercial sector. *IT Training*, 2:20-21.

JOUVETESTING.ORG. 2004. Here are some related websites. [Web:] http://www.jouvetesting.org/eng/tests/tri/pages/ [Date of access: 30 December 2004].

KAPLAN-LEISERSON, E. 2002. E-learning glossary. [Web:] http://www.learningcircuits. org/glossary.html [Date of access: 11 April 2003].

KEARSLEY, G. 2005a. Contiguity theory on the theory into practice database website. [Web:] http://tip.psychology.org/guthrie.html [Date of access: 3 January 2005].

KEARSLEY, G. 2005b. Constructivist theory on the theory into practice database website (J. Bruner). [Web:] http://tip.psychology.org/bruner.html [Date of access: 1 March 2006].

KEARSLEY, G. 2005c. Connectionism. [Web:] http://tip.psychology.org/thorn.html [Date of access: 1 March 2006].

KEEGAN, D. 1990. A theory for distance education. (*In* Moore, M.G., *ed.* Contemporary issues in American distance education. Oxford: Pergamon. p. 327–332.)

KEEGAN, D. 1992. The theoretical underpinnings of distance education. (*In* Ortner, G.E., Graff, K. & Wilmersdoerfer, H., *eds.* Distance education as two-way communication, essays in honour of Börje Holmberg. Frankfurt am Main: Peter Lang. p. 76–86).

KEEGAN, D. 1996. Foundations of distance education. 3rd ed. London: Routledge. 214 p.

KEEGAN, D.J. 1980. On defining distance education. *Distance education*, 1(1):13–36. (*In* Van Niekerk, M.H., Heese, M. & Mackintosh, W.G., *eds.* Discovering distance education. Pretoria: University of South Africa. 491 p. (Reader for PGDDE1-3/PGDDE4-6.)

KELSO, J.A.S. 1995. Dynamic patterns: the self-organization of brain and behavior. Cambridge, Mass.: Massachusetts Institute of Technology Press. 360 p.

KEMBER, D. 1995. Open learning courses for adults: a model of student progress. Englewood Cliffs, N.J.: Education Technology Publications. 271 p.

KIRBY, D. 1993. Is it time to rid universities of distance education? *Journal of distance education,* 8(2):69-72, Autumn.

KNOWLES, M.S. 1970. The modern practice of adult education andragogy versus pedagogy. Chicago: Follett. 384 p.

KOZMA, R.B. 1994. Will media influence learning? Refra· ıing the debate. *Educational technology research and development*, (42)2:7–20.

KRISTINSDÓTTIR, S.B. 2001a. Lev Vygotsky. [Web:] http://starsfolk.khi.is/solrunb/vygotsky.htm [Date of access: 18 March 2006].

KRISTINSDÓTTIR, S.B. 2001b. J. Bruner. [Web:] http://starsfolk.khi.is/solrunb/jbruner.htm [Date of access: 18 March 2006].

KRISTINSDÓTTIR, S.B. 2001c. Reuven Feuerstein. [Web:] http://starsfolk.khi.is/solrunb/ feuerst.htm [Date of access: 18 March 2006].

KYLLONEN, P.C. & SHUTE, V.J. 1989. A taxonomy of learning skills. (In Ackerman, P.L., Sternberg, R.J. & Glaser, R., eds. Learning and individual differences. New York: Freeman. p. 117–173.)

LANDMARK PROJECT. 2006. Global grocery list project. [Web:] http://www.landmark-project.com/ggl/index.html [Date of access: 24 March 2006].

LEARNING CIRCUITS. 2004. Glossary. [Web:] http://www.learningcircuits.org/glossary.html#E [Date of access: 11 April 2004].

LEARNTHAT. 2004. Free definitions: define pixel. What is pixel? [Web:] http://www.learnthat.com/define/view.asp?id=60 [Date of access: 27 April 2006].

LEWIS, N.J. & ORTON, P. 2000. The five attributes of innovative E-learning. *Training & development,* 6:47-51, June.

LOHMANN, J.S. 1998. Classrooms without walls: three companies that took the plunge. *Training & development*, 52(9):39-41, September.

LONGMAN DICTIONARY OF CONTEMPORARY ENGLISH. 1987. 2nd ed. Burnt Mill, Harlow: Longman House. 1229 p.

MACKINTOSH, W.G., WAGHID, Y. & VAN NIEKERK, D. 1997. Open and distance Learning. Pretoria: University of South Africa. 227 p. (Study manual A for PGDDE1-3.)

MARKET NAVIGATION INC. 2005. Concept "testing' in focus groups. [Web:] http://www.mnav.com/contest.htm [Date of access: 3 October 2005].

MAYBERRY, E. 2000. Pointers on partnering with IT. *Training & development*, 12:36-37, December.

MCCREA, R. & GAY, K. & BACON, R. 2000. Riding the big waves. *IT training*, 1: 8-9.

MCKENZIE, J. 1999. Scaffolding for success. [Web:] http://www.fno.org/dec99/scaffold.html [Date of access: 16 June 2006].

MEDIAPRO. 2001. E-learning are you ready? [Web:] http://www.mediapro.com/html/resources/readiness.html [Date of access: 3 January 2005].

MEHRABIAN, A. 1971. Silent messages. Belmont, Calif.: Wadsworth. 152 p.

MENDELSOHN, P.K. 1998. Andragogy (M.Knowles) on the TECFA education & technology website. [Web:] http://tecfa.unige.ch/themes/sa2/act-app-dos2-fic-andragog.htm [Date of access: 21 March 2006].

MERGEL, B. 1998. Instructional design and learning theory on the University of Saskatchewan website. [Web:] http://www.usask.ca/education/coursework/802papers/mergel/brenda.htm [Date of access: 3 January 2003.

MERRIL, D. 1991. Constructivism and instructional design. *Educational technology,* (31)5:45–52, May.

MEYER, M., OPPERMAN, C. & DYRBYE, C. 2003. Measuring ROI in training. Randburg: Knowres Publishing (Pty) Ltd. 173p.

MINTON, M.C. 2000. Is your organization ready for e-learning? on the Communication project, inc. website. [Web:] http://www.comproj.com/Minton.htm [Date of access: 17 January 2006].

MOORE, M.G. 1972. Learner autonomy: the second dimension of independent learning. *Convergence,* 5(2):76–87.

MOORE, M.G. 1973. Towards a theory of independent learning and teaching. *Journal of Higher education,* 44(12):661–679, Dec.

MOORE, M.G. 1977. A model of independent study. *Epistolodidaktika,* 1(6):6–39.

MOORE, M.G. 1986. Self-directed learning and distance education. *Journal of distance education,* 1(1):7–24, Autumn.

MOORE, M.G. 1990a. Recent contributions to the theory of distance education. *Open learning,* 5(3):10-15, Nov.

MOORE, M.G. 1990b. Introduction: Background and overview of contemporary American distance education. (*In* Moore, M.G., *ed.* Contemporary issues in American distance education. Oxford: Pergamon. p. ix–xii.)

MOORE, M.G. 1993a. Is teaching like flying? A total systems view of distance education. *American journal of distance education*, 7(1):1–10.

MOORE, M.G. 1993b. Three types of interaction. (*In* Harry, K., John, M. & Keegan, D., *eds*. Distance education: new perspectives. London: Routledge. 348 p.)

MOORE, M.G. & KEARSLEY, G. 1996. Distance education a systems view. Belmont: Wadsworth. 290 p.

MORAINE VALLEY COMMUNITY COLLEGE. 2004. Online readiness test. [Web:] http://online.morainevalley.edu/quizA.htm [Date of access: 21 December 2004].

MORAN, J.V. 2000. Top ten e-learning myths. *Training & development*, 9:32-33, September.

MY LANGUAGE EXCHANGE.COM. 2006. Your language exchange online community. [Web:] http://www.mylanguageexchange.com [Date of access: 23 March 2006].

NEAL, E. 1999. Distance education: prospects and problems. *National forum*, 79(1):40-43, Winter.

NEWBY, T.J., STEPICH, D.A., LEHMAN, J.D. & RUSSELL, D.J. 2000. Instructional technology for teaching and learning. 2nd ed. London: Prentice-Hall. 313 p.

NEWMAN, A. & SMITH, M. 1999. How to create a virtual learning community. *Training & development,* 53(7):44-48, 47-48, July.

ONLINE REPORTING SPECIALISTS. 2005. Definition of terms. [Web:] http://orstt.tripod.com/Definitions.htm [Date of access: 3 October 2005].

OOSTHUIZEN, S. 1978. Fundamentele aspekte van sielkundige toetsing. Durban: Butterworth. 95 p.

PEARSON ASSESSMENTS. 2004. General ability measure for adults. [Web:] http://www.pearsonassessments.com/tests/gama.htm#questions [Date of access: 30 December 2004].

PEASE, A. 1985. Lyftaal. Eerste sakformaat uitgawe. Parow: Tafelberg. 143 p.

PENN STATE COLLEGE OF EDUCATION. 2006a. Anchored instruction. [Web:] http://www.ed.psu.edu/nasa/achrtxt.html [Date of access: 21 March 2006].

PENN STATE COLLEGE OF EDUCATION. 2006b. Adventures of Jasper Woodbury. [Web:] http://www.ed.psu.edu/nasa/www.htm [Date of access: 21 March 2006].

PERKINS, D.N. 1992. Technology meets constructivism: do they make a marriage? (*In* Duffy, T.M. & Jonassen, D.H., *eds.* Constructivism and the technology of instruction. Hillsdale, N.J.: Erlbaum. p. 45–55.)

PETERS, O. 1989. The iceberg has not melted: further reflections on the concept of industrialization and distance teaching. *Open Learning,* 4(3):3–8, Nov.

PETERS, O. 1992. Distance education: a revolutionary concept. (*In* Ortner, G.E., Graff, K.& Wilmersdoerfer, H., *eds.* Distance education as two-way communication, essays in honour of Börje Holmberg. Frankfurt am Main: Peter Lang. p. 28–34.)

PETERS, O. 1996. Distance education is a form of teaching and learning sui generic. *Open learning,* 11(4):51–54, Feb.

POLIT, D.F. & HUNGLER, B.P. 1999. Nursing research: principles and methods. 6th ed. Philadelphia, Pa.: Lippincott Wiliams & Wilkins. 757 p.

PONT, T. 1996. Developing effective training skills: a practical guide to designing and delivering group training. 2nd ed. Berkshire: McGraw-Hill. (McGraw-Hill Training Series.) 157 p.

PORTWAY, P.S. & LANE, C. 1994. Guide to teleconferencing and distance learning. 2nd ed. Livermore: Applied Business Communications. 448 p.

PROJECT DEVISE. 2001. Project DEVISE management site, Spring 2001. [Web:] http://it.gse.gmu.edu/devise/dvphase4/index.html [Date of access: 24 March 2006].

PSYCHARIS, S. 2005. Presumptions and actions affecting an e-learning adoption by the educational system implementation using virtual private networks on the European journal of open, distance and e-learning website. [Web:] http://www.eurodl.org/materials/contrib/ 2005/Sarantos_Psycharis.htm [Date of access: 17 January 2006].

PURDUE UNIVERSITY CALUMET SCHOOL OF NURSING. 2004. Pre-assessment survey of computer and World Wide Web navigation skills. [Web:] http://www.calumet.purdue.edu/nursing/orientation/preassessment.html [Date of access 16 October 2004].

Quality Strategies International. 2003. Quality, environment, documenting of auditing ISO management systems – A Sasol in-house 5 day course. Module 2 Revision 2: 2. 10 p.

QUESTIONPRO SURVEY SOFTWARE. 2005. QuestionPro online research made easy. [Web:] http://www.questionpro.com/ [Date of access: 3 January 2006].

RAGAN, L.C. 1999. Good teaching is good teaching. An emerging set of guiding principles and practices for the design and development of distance education. *CAUSE-EFFECT,* 22(1):20–24.

RANGECROFT, M., GILROY, P., LONG, P. & TRICKER, T. 1999. What is important to distance education students? *Open learning*, 14(1):17-24, Feb.

REEVES, T.C. 1997. Evaluating what really matters in computer-based education on the education.au website. [Web:] http://www.educationau.edu.au/jahia/Jahia/pid/179 [Date of access: 20 June 2002].

REEVES, T.C. & HARMON, W. 1994. Systematic evaluation procedures for interactive multimedia for education and training. (*In* Reisman, S., *ed.* Multimedia computing: preparing for the 21st Century. Harrisburg, Pa.: Ida Group. p. 472–505.)

REIGELUTH, C.M. 1996. A new paradigm of ISD? *Educational technology*, 36(3):13-20, May-June.

REIGELUTH, C. 1999. Instructional-design theories and models: a new paradigm of instructional theory, v 2. Hillsdale, N.J.: Erlbaum. 512 p.

REIGELUTH, C.M. 1996. A new paradigm of ISD? *Educational technology*, 36(3):13-20, June.

REIGELUTH, C.M. 1997. Instructional theory, practitioners needs, and new directions: some reflections. *Educational technology,* 37(1):42-47, Jan–Feb.

RESNICK, B. 1998. Knowing, learning and instruction. Hillsdale, N.J.: Erlbaum.

RICE VIRTUAL LAB IN STATISTICS. 2004. Describing univariate data. [Web:] http://davidmlane.com/hyperstat/desc_univ.html [Date of access: 3 October 2005].

ROBINSON, R. 2000. Classroom versus technology based learning - a relevant debate? *Management today*, 16(9):35-36, October.

ROS, C. 1998. Community nurses experience of distance learning: implications for autonomy and dependence. *Nurse education today*, 18(8):610–615, Nov.

ROSENBERG, M.J. 2000. The e-learning readiness survey on the university of Calgary website. [Web:] http://www.ucalgary.ca/~srmccaus/eLearning_Survey.pdf [Date of access: 15 January 2006].

RUMBLE, G. 1989. On defining distance education. *American journal of distance education*, 3(2):8-21.

RUSSELL, T. 2006. No significant difference phenomenon. [Web:] http://nosignificantdifference.wcet.info/search.asp [Date of access: 27 April 2006].

RYAN, M., CARLTON, K.H. & ALI, N.S. 1999. Evaluation of traditional classroom teaching methods versus course delivery via the World Wide Web. Journal of nursing education, 38(6):272-277, Sept.

RYAN, W.J. 1997. Delivery systems review. Journal of interactive instruction development, 10(1):18–24, Summer.

RYDER, M. 2006a. Constructivism on the University of Colorado at Denver website. [Web:] http://carbon.cudenver.edu/~mryder/itc/constructivism.html [Date of access: 1 March 2006].

RYDER, M. 2006b. Instructional design models on the University of Colorado at Denver website. [Web:] http://carbon.cudenver.edu/~mryder/itc_data/idmodels.html [Date of access: 1 March 2006].

RYDER, M. & WILSON, B. 1996. Affordances and constraints of the internet for learning and instruction. [Web:] http://www.nwe.ufl.edu/~jbess/phd/sourceTexts/AECTAffordnces/html [Date of access: 15 April 2006].

SABA, F. 1988. Integrated telecommunication systems and instructional transaction. *American journal of distance education,* 2(3):17–24.

SABA, F. 1999a. Towards a systems theory of distance education. *American journal of distance education,* 13(2):24-31, March.

SABA, F. 1999b. An introduction for distance education (and) five essential factors every administrator needs to know about integrated communication infrastructures. *Distance education report. Special report: telecommunications,* 3(8), Supp1:1-8, Apr.

SAMPSON, J.P. 1999. Integrating Internet-based distance guidance with services provided in career centres. *Career development quarterly*, 47(3):243-254, March.

SANDWELL, R. & LUTZ, J. 2006. Who killed William Robinson. [Web:] http://web.uvic.ca/history-robinson/indexmsn.html [Date of access: 21 March 2006].

SANTOS, J.R.A. 1999. Cronbach's alpha: a tool for assessing the reliability of scales. Journal of extension: an electronic journal, 37(2), April. [Web:] http://www.joe.org/joe/1999april/tt3.html [Date of access: 3 June 2006].

SASOL SYNFUELS. 2006. Percentage utilisation of the multimedia center for the year 2005-2006. (Excell graphics document compiled by L. van Rensburg as part of ..... for Sasol Synfuels.) Secunda. (Unpublished).

SAS INSTITUTE. 1999. Computing Cronbach's alpha coefficient. [Web:] http://www.uc.edu/sashtml/proc/zorr-ex3.htm [Date of access: 3 June 2006].

SAVERY, J.R. & DUFFY, T.M. 1995. Problem based learning: an instructional model and its constructivist framework. *Educational technology,* 35:31-38.

SCARDAMALIA, M. & BEREITER, C. 1994. Computer support for knowledge building communities. *Journal of the learning sciences,* 3(3):265–283.

SCHOOL OF PHARMACY AND HEALTH PROFESSIONS. 2004. Online learning. [Web:] http://pt.creighton.edu/npt900/Online_Learning.htm [Date of access: 21 December 2004].

SCHRIVER, R. & GILES, S. 1999. Real ROI numbers. *Training & development,* 53(8):51-52, August.

SCHRUM, L. 1999. Trends in distance learning: lesson to inform practice. (*In* Branch, R.M. & Fitzgerald, M.A., *eds.* Educational media and technology yearbook. Englewood, Colorado: Libraries Unlimited. p. 11-16.)

SCHÜTZ, R. 2004. Vygotsky & language acquisition. [Web:] http://www.english.sk.com .br/sk-vygot.html [Date of access: 1 March 2006].

SEELS, B. 1997. Taxonomic issues and the development of theory in instructional technology. Educational technology, 37(1):12–21.

SIEMENS, G. 2004. Categories of e-learning on the Elearnspace website. [Web:] http://www.elearnspace.org/Articles/elearningcategories.htm [Date of access: 7 May 2006].

SMITH, P.L. & DILLON, C.L. 1999a. Towards a systems theory of distance education; a reaction. *American journal of distance education,* 13(2):32-36.

SMITH, P.L. & DILLON, C.L. 1999b. Comparing distance learning and classroom training: conceptual considerations. *American journal of distance education*, (13)2:6–23.

SMITH, P.L. & RAGAN, T.J. 1999. Instructional Design. 2nd edition. New York: John Wiley and Sons, Inc. 399 p.

SMITH, T.W. 1998. Distance education is a strategy: What is the objective? *American journal of distance education,* 12(2):63–72.

SNYDER, K., FARRELL, R. & BAKER, N. 2000. Online mentoring: a case study involving cognitive apprenticeship and a technology-enabled learning environment on the IBM website. [Web:] http://www.research.ibm.com/AppliedLearningSciWeb/Snyder/edmedia.htm [Date of access: 21 March 2006].

SPIRO, R.J., FELTOVICH, P.J., JACOBSON, M.J. & COULSON, R.L. 1992. Cognitive flexibility, constructivism, and hypertext: random access instruction for advanced knowledge acquisition in ill-structured domains on Martin Ryders website. [Web:] http://phoenix.sce. fct.unl.pt/simposio/Rand_Spiro.htm [Date of access: 22 March 2006].

STANDARD BANK. 2006. Welcome to Standard bank's virtual tour to online tradind. [Web:] https://www.scmb.co.za/servlets/za.co.scmb.www.fetcher.EquitiesPublicFetcher/demo/demo.asp [Date of access: 27 April 2006].

STEPIEN, W.J. & GALLAGHER, S.A. 1993. Problem based learning: as authentic as it gets. *Educational leadership,* 50(7):25–28, April.

STEYN, A.G.W., SMIT, C.F., DU TOIT, S.H.C. & STRASHEIM, C. 2000. Moderne statistiek vir die praktyk. 2de uitg. Pretoria: Van Schaik. 761 p.

STEYN, H.S. (jr.) 1999. Praktiese beduidenheid: die gebruik van effekgroottes. Potchefstroom: Potchefstroomse Universiteit vir Christelike Hoër Onderwys. 28 p.

STEYN, H.S. (jr.) 2002. Practically significant relationships between two variables. *SA journal of industrial psychology,* 28(3):10-15.

STONE, D.E. & BISHOP, C.A. 1997. Web-Based training: how to really do it. *Journal of instruction delivery systems,* 11(4):3-9, Fall.

TECHNOLOGY AND EDUCATION REFORM. 2006. The city building project on the Technology and reform website. [Web:] http://www.ed.gov/pubs/EdreformStudies/EdTech/city.html [Date of access: 24 March 2006].

THOMPSON, K. 2006. Constructivist curriculum design for professional development: a review of the literature. [Web:] http://pegasus.cc.ucf.edu/~kthompso/projects/lit_constructivist.pdf [Date of access: 18 March 2006].

TRENTON, G. & SCIMECA, S. 1999. The roles of tutors and experts in designing online education courses. *Distance education*, (20)1:144-161.

UCLA ACADEMIC TECHNOLOGY SERVICES. 2006. What does Cronbach's alpha mean? [Web:] http://www.ats.ucla.edu/STAT/SPSS/faq/alpha.html [Date of access: 2 June 2006].

UNIVERSITY OF BERKELY. 2006. Theories of learning: introduction. [Web:] http://gsi.berkeley.edu/resources/learning [Date of access: 20 March 2006].

UNIVERSITY OF MARYLAND UNIVERSITY COLLEGE. 2005. Virtual resource site for teaching with technology. [Web:] http://www.umuc.edu/virtualteaching/vt_home.html [Date of access: 27 December 2005].

UNIVERSITY OF NORTH CAROLINA GREENSBORO. 2004. Self-assessment: is online learning for me? [Web:] http://web.uncg.edu/dcl/icampus/resource/assessment.asp [Date of access: 21 December 2004].

UNIVERSITY OF NORTH DAKOTA. 2006. Volcanoworld. [Web:] http://volcano.und. nodak.edu/ [Date of access: 21 March 2006].

UNIVERSITY OF WASHINGTON. 2006. Instructional design approaches on the University of Washington website. [Web:] http://depts.washington.edu/eprojects/Instructional%20Design%Approaches.htm [Date of access: 20 March 2006].

VALDES, R. 2006. How VoIP works. [Web:] http://computer.howstuffworks.com/ip-telephony.htm [Date of access: 18 April 2006].

VAN DER HORST, H. & MACDONALD, R. 1997. OBE outcomes-based education a teacher's manual. Pretoria: Kagiso. 254 p.

WAMBACH, K. & BOYLE, D. & HAGERMASTER, J., TEEL, C., LANGNER, B., FAZZONE, P, CONNORS, H., SMITH, C. & FORBES, S. 1999. Beyond correspondence, video conferencing, and voice mail: Internet-based master's degree courses in nursing. *Journal of nursing education*, 38(6):267–271, 269, September.

WANG, F. 2001. A design framework for electronics cognitive apprenticeship. *Journal of asynchronous learning networks*, 5(2). [Web:] http://www.sloan-c.org/publications/jaln/v5n2_wang.asp [Date of access: 21 March 2006].

WEBTECH. 2006. Great ideas in education Rand J. Spiro on the Webtech University of Florida website. [Web:] http://www.coe.ufl.edu/webtech/GreatIdeas/pages/peoplepage/spiro.htm [Date of access: 22 March 2006].

WESTERN GOVERNORS UNIVERSITY. 2005. Admission requirements. [Web:] http://www.wgu.edu/admissions/requirements.asp [Date of access: 15 January 2005].

WHITE, H.B. 1997. Hot-headed moles in Antarctica on the university of Delaware website. [Web:] http://www.udel.edu/pbl/hotheads.html [Date of access: 21 March 2006].

WIKI ORGANIZATION. 2002. What is Wiki?. [Web:] http://wiki.org/wiki.cgi?WhatIsWiki [Date of access: 18 April 2006].

WILSON, B. & COLE, P. 1991. Cognitive teaching models on the instructional technology global research network website. [Web:] http://www.ittheory.com/cogapp.htm [Date of access: 21 March 2006].

WILSON, B. & RYDER, M. 1996. Dynamic learning communities: an alternative to designed instructional systems. [Web:] http://carbon.cidenver.edu/~mryder/dlc.html [Date of access: 21 March 2006].

WILSON, B., TESLOW, J. & OSMAN-JOUCHOUX, R. 1995. The impact of constructivism (and Postmodernism) on ID fundamentals. [Web:] http://www.ittheory.com/ dfund.htm [Date of access: 21 March 2006].

WILSON, B.G. 1995. Situated instructional design: blurring the distinction between theory and practice, design and implementation, curriculum and instruction. [Web:] http://www. ittheory.com/sitid.htm [Date of access: 21 March 2006].

WILSON, B.G. 1997a. Thoughts on theory in educational technology. *Educational technology*, 37(1):22–27.

WILSON, B.G. 1997b. Reflections on constructivism and instructional design. [Web:] http://carbon.cudenver.du/%7Ebwilson/construct.html [Date of access: 1 March 2006].

WINN, W. 1997. Advantages of a theory-based curriculum in instructional technology. *Educational technology*, 37(1):34-41, Jan-Feb.

WORKNOWLEDGE. 2004. E-learning readiness assessment. [Web:] http://www. worknowledge.com/e-assessment/ [Date of access: 21 December 2004].

WORLD WIDE LEARN. 2006. Types of e-learning. [Web:] http://www.worldwidelearn. com/elearning-essentials/elearning-types.htm [Date of access: 28 April 2006].

GLOSSARY

Animation: movement of text or graphics created by software designed or this purpose.

Asynchronous learning: Learning in which interaction between instructors and students occurs intermittently with a time delay. Examples are self-paced courses taken via the Internet or CD-ROM, online mentoring, online discussion groups, and email.

Audioconferencing: Voice-only connection of more than two sites using standard telephone lines.

Audiographics: Computer-based technology that enables simultaneous transmission of voice, data, and graphic images across local telephone lines for instructor-learner interaction

Bandwidth: The information carrying capacity of a communication channel

Browser: A software application that displays World Wide Web pages originally written in the text-based HTML language in a user-friendly graphical format.

Bit: The most basic unit of information on a computer. In accordance with binary code, each bit is designated as either a 1 or a 0; all other information stored on the computer is composed of combinations of bits.

BBS (bulletin board system): An online community runs on a host computer that users can dial or log into in order to post messages on public discussion boards, send and receive email, chat with other users, and upload and download files. BBSs are text-based and often related to the specific hobbies or interests of their creators

Blended learning: Learning events that combine aspects of online and face-to-face instruction

Blog (Web Log): regular journal entries on a personal website placed for public viewing and comments.

Bulletin board and discussion forums: A web server that allows people to connect in a virtual way similar to a notice board on a wall.

CD-ROM (compact disc read-only memory or **compact disc read-only media):** A computer storage medium similar to the audio CD that can hold more than 600 megabytes of read-only digital information.

Chat: Real-time text-based communication in a virtual environment. Chat can be used in e-learning for student questions, instructor feedback, or even group discussion.

C-Learning: Face to face learning in a class room context.

ILT (instructor-led training): Usually refers to traditional classroom training, in which an instructor teaches a course to a room of learners. The term is used synonymously with on-site training and classroom training (c-learning).

Cyberspace: The nebulous "place" where humans interact over computer networks; term coined by William Gibson in *Neuromancer.*

CBT (computer-based training): An umbrella term for the use of computers in both instruction and management of the teaching and learning process. CAI (computer-assisted instruction) and CMI (computer-managed instruction) are included under the heading of CBT. Some people use the terms CBT and CAI interchangeably.

Computer conferencing: Interactive dialogue over the internet. Usually a webpage that can be visited and information can be posted back and forth using special software.

Delivery: Any method of transferring content to learners, including instructor-led training, Web-based training, CD-ROM, books, and more

Desktop: personal computer at your desk.

Digital: An electrical signal that varies in discrete steps in voltage, frequency, amplitude, locations, and so forth. Digital signals can be transmitted faster and more accurately than analogue signals.

Digital audio: synthesised computer generated sound.

Digital video: video files showing continuous images.

Direct manipulation interface: An interface is the screen through which the learner and the computer communicate. Manipulation takes place through objects e.g. buttons, drag and drop abilities etcetera It allows for continuous representation of the objects of interest.

Distance education: Educational situation in which the instructor and students are separated by time, location, or both. Education or training courses are delivered to remote locations via synchronous or asynchronous means of instruction, including written correspondence, text, graphics, audio- and videotape, CD-ROM, online learning, audio- and videoconferencing, interactive TV, and FAX. Distance education does not

preclude the use of the traditional classroom. The definition of distance education is broader than and entails the definition of e-learning.

Discussion board: Forum on the intra- or internet where messages can be posted for others to see

Document sharing: Groupware that allows for document sharing. Documents can be stored, shared and retrieved.

E-learning (electronic learning): 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.

Electronic mail: mail sent over the internet and can include text, graphics, sound and other attachments.

F2F (face-to-face): Term used to describe the traditional classroom environment

Facilitator: The online course instructor who aids learning in the online, student-centered environment.

Fiber-optic cable: Glass fiber used for laser transmission of video, audio, and/or data. Fiber-optic cable has a much greater bandwidth capacity than conventional cable or copper wire

GB (gigabyte): Just over one billion bytes. 1,000 megabytes.

GIF (Graphics Interchange Format): The ile format developed by CompuServe to store images. GIFs support 256 colors and are often used for Web images because they compress well.

Google: an internet search engine. A program designed to identify text, images on the internet.

Graphics: Static or animated image or video file.

Groove: collaborative groupware

Groupware: Software designed for use by groups and communication.

Hypermedia: Computer addressable files that links to multimedia, and or other objects. A product that connects media e.g. a website has links to other media or websites.

Internet: An international network first used to connect education and research networks, begun by the US government. The Internet now provides communication and application services to an international base of businesses, consumers, educational institutions, governments, and research organizations.

Intranet: A LAN or WAN that's owned by a company and is only accessible to people working internally. It is protected from outside intrusion by a combination of firewalls and other security measures

Interactive media: Allows for a two-way interaction or exchange of information

Internet relay chat: internet technology that enables people to type messages to each other though a text-based network in real time. Access to the network is gained by logging on to a special server.

Just-in-time: Characteristic of e-learning in which learners are able to access the information they need exactly when they need it.

JPEG (Joint Photographic Experts Group): 1) A format for image compression that enables the user to weigh image quality against file size. 2) The subgroup of the International Organization for Standardization **[link to ISO]** responsible for setting the standards for this format.

LAN (local-area network): A group of personal computers and/or other devices, such as printers or servers, that are located in a relatively limited area, such as an office, and can communicate and share information with each other.

Learning: A cognitive and/or physical process in which a person assimilates information and temporarily or permanently acquires or improves skills, knowledge, behaviors, and/or attitudes.

Link: The result of HTML markup signifying to a browser that data within a document will automatically connect with either nested data or an outside source. Used in the design of hypertext

Listserv: A form of one-to-many communication using email; a software program for automating mailing lists and discussion groups on a computer network

LMS: learner management system

LCMS: Learner content management system

Multimedia: Encompasses interactive text, images, sound, and color. Multimedia can be anything from a simple PowerPoint slide slow to a complex interactive simulation

MUD and MOO: Multiple user dimensions that allow multiple users to enter one site where they can manipulate text or objects in real time.

Navigation: Finding your way from page to page on the World Wide Web.

Network: Two or more computers that are connected so users can share files and devices (for example, printers, servers, and storage devices).

Online: The state in which a computer is connected to another computer or server via a network. A computer communicating with another computer

Online training: Web- or Internet-based training.

Pixel:- the smallest element of a display that can carry a colour

PDA: Personal digital assistant

Plug-in: An accessory program that adds capabilities to the main program. Used on Webpages to display multimedia content.

Real-time communication: Communication in which information is received at (or nearly at) the instant it's sent. Real-time communication is a characteristic of synchronous learning

Self contained instructional modules: grouping of the same type of knowledge in chunks or modules of instruction.

Search engine: a software application that has the ability to find words, phrases and files on the internet.

Server: A computer with a special service function on a network, generally to receive and connect incoming information traffic.

Simulations: Highly interactive applications that allow the learner to model or role-play in a scenario. Simulations enable the learner to practice skills or behaviors in a risk-free environment

Soft skills: Business skills such as communication and presentation, leadership and management, human resources, sales and marketing, professional development, project and time management, customer service, team building, administration, accounting and finance, purchasing, and personal development.

Storyboard: (noun) An outline of a multimedia project in which each page represents a screen to be designed and developed. (verb) To create a storyboard

Streaming media (streaming audio or video): Audio or video files played as they are being downloaded over the Internet instead of users having to wait for the entire file to download first. It requires a media player program.

Synchronous learning: A real-time, instructor-led online learning event in which all participants are logged on at the same time and communicate directly with each other. In this virtual classroom setting, the instructor maintains control of the class, with the ability to "call on" participants. In most platforms, students and teachers can use a whiteboard to see work in progress and share knowledge. Interaction may also occur via audio- or videoconferencing, Internet telephony, or two-way live broadcasts.

Telecommunication: The science of information transport using wire, radio, optical, or electromagnetic channels to transmit and receive signals for voice or data communications

Teleconferencing: Two-way electronic communication between two or more groups in separate locations via audio, video, and/or computer systems

Videoconferencing: Using video and audio signals to link participants at different and remote locations

Virtual: Not concrete or physical. For instance, a completely virtual university does not have actual buildings but instead holds classes over the Internet.

Virtual chat: Software allows participants to communicate on the Internet at the same time by creating a room where ideas etcetera can be exchanged.

Virtual classroom: The online learning space where students and instructors interact.

Virtual community: See online community.

VoIP: Voice over internet protocol like Skype

WBT (Web-based training): Delivery of educational content via a Web browser over the public Internet, a private intranet, or an extranet. Web-based training often provides links to other learning resources such as references, email, bulletin boards, and discussion groups. WBT also may include a facilitator who can provide course guidelines, manage discussion boards, deliver lectures, and so forth. When used with a

facilitator, WBT offers some advantages of instructor-led training while also retaining the advantages of computer-based training

WWW (World Wide Web): A graphical hypertext-based Internet tool that provides access to Webpages created by individuals, businesses, and other organizations

Whiteboard: An electronic version of a dry-erase board that enables learners in a virtual classroom to view what an instructor, presenter, or fellow learner writes or draws. Also called a smartboard or electronic whiteboard

Wiki: A piece of "open" software on web pages that allows content to be freely edited by any user.

GUI (graphical user interface): A computer interface using icons or pictures. For example, Windows (Learning Circuits, 2004; Dabbagh, 2005: 325 - 334; Newby *et al,* 2000: 291 – 299; What is wiki, 2002; Learnthat, 2004; Valdes, 2006).

APPENDIX A

E-READINESS MODEL DATABASE

Due to the size and layout of the database as well as the specific abilities of Microsoft Excel to sort, filter and store information in the form of comment boxes, the database has been stored in CD-ROM format. It is best for quick referencing during use.

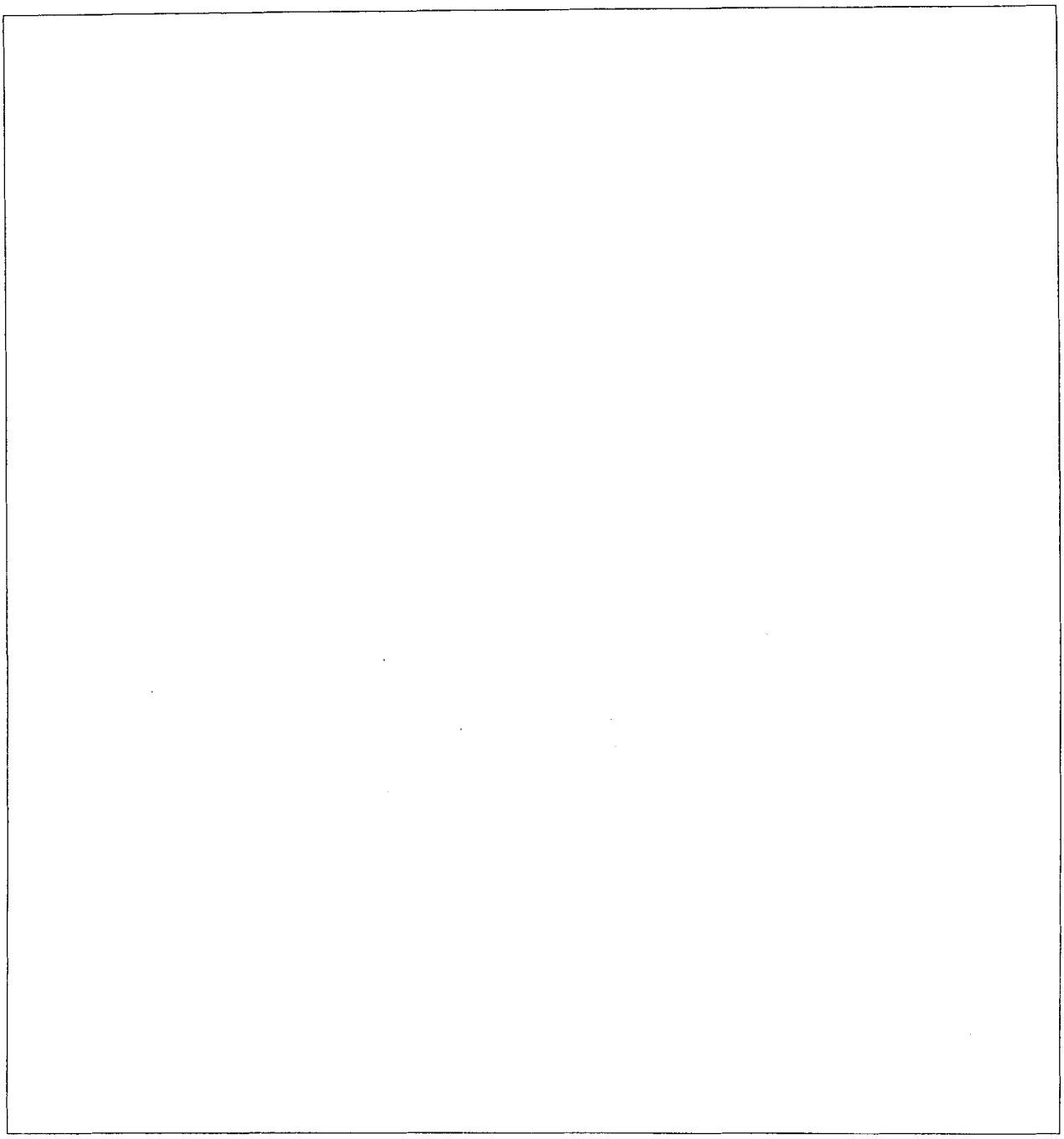
To view the database please follow the instructions below:

1. Insert CD in CD-Rom drive of your computer
2. Open the file on the CD called E-readiness database in the Microsoft Office Excel program

The following can be viewed once the database is open:

1. The worksheet titled revision 1 and revision 2 demonstrates the process of analysis followed to filter through all the data collected from the literature study.
2. The worksheet titled "Final audit tool" is the database used for referencing when the empirical research was executed.
3. The database can be filtered by selecting specific categories when the drop down menu is opened in the top line.
4. The cells contain comment boxes which provide further description and clarification of the content.

E-Readiness Database



(Hall, 2005; Figueira, 2005; Hughes & Attwell, 2005; ETS TOEFL, 2004; ETS Criterion, 2004; English for everybody, 2005; College Board Accuplacer, 2005; Jouvetesting.org, 2004; Pearson assessments, 2004; Happy Neuron, 2004; School of pharmacy and health professions, 2004; Guglielmino & Associates, 2004: University of North Carolina Greensboro, 2004; Worknowledge, 2004; ITpreneurs, 2004; Mediapro, 2001; Purdue University Calumet School of Nursing, 2004; Moraine Valley Community College, 2004).

APPENDIX B

PHASE TWO: PILOT QUESTIONNAIRE

(Direct copy of the online version compiled with Questionpro)

E-LEARNING READINESS IN THE WORKPLACE: .

Subject: - A request for assistance in E-Readiness research.

Dear Sir Madam

Your response in this research project IS CRUCIAL in order to ensure that the sample is representative.

Purpose of the study:

To develop a workplace model for the training of employees in distance education (E-LEARNING).

With this research, criteria or pre- requisites for e-learning are established with which such a training event will have to comply with, in order to ensure or at least predict success of the event. It is expected of you to rate the importance of each criterion and add more if you feel any have been left out.

The model can be used as a tool to plan for, audit and manage the learning event more effectively.

This questionnaire aims at ESTABLISHING all the pre-requisites necessary for e-learning. In other words what needs to be in place before e-learning should commence.

Instructions on completion of the questionnaire and the return address are provided within. I hope you don't mind, but I would like to follow up with reminding e-mails as your assistance is really of importance.

Final submission date 30 April 2005.

Your participation in this study is completely voluntary. There are no foreseeable risks associated with this project. However, if you feel uncomfortable answering any questions, you can withdraw from the survey at any point. It is very important for us to learn your opinions.

Your survey responses will be strictly confidential and data from this research will be reported only in the aggregate. Your information will be coded and will remain confidential. If you have questions at any time about the survey or the procedures, you may contact LINETTE RAUTENBACH at 082 416 9881 or by email at the email address specified below.

Thank you very much for your time and support. Please start with the survey now by clicking on the **Continue** button below.

[redacted]

[redacted]

1. Please provide your name (optional)

[redacted]

2. E-mail address:-

[redacted]

[redacted]

3. How many years of experience do you have in e-learning?

Less than 5 years | 5 years and more but less than 10 years | 10 years and more but less than 15 years | More than 15 years

[redacted]

4. What is your current relationship to E-learning?(choose only one answer that describes your relationship the closest)

I am a learner making use of e-learning to study.

I am an educator/facilitator using e-learning in training.

I am a manager involved with e-learning.

I am an Instructional Designer.

I am part of a support team of e-learning courses namely a media designer or instructional technologist or programmer or, network specialist, subject matter expert or quality specialist or sponsor.

Other doctoral student in adult online learning

5. What is the context of your involvement with e-learning?

University, college or other institution for further education and training.

School for children.

The workplace (any business, industry etc.)

Other

6. What types of e-learning do you have experience in? (YOU CAN CHOOSE MORE THAN ONE IF APPLICABLE).

✔ Purely online (no face-to-face meetings).

✔ Blended Learning (combination of online and face-to-face).

✔ Synchronous.

✔ Asynchronous.

- [x] Instructor-led group.
- [x] Self-study? Text online.
- [x] Web-based.
- [ ] Computer-based (CD-ROM).
- [ ] Video/audio tape.
- [ ] Self-study with subject matter expert.
- [ ] Other

[redacted]

[redacted]

7.

	Strongly Agree	Agree	Disagree	Strongly Disagree
a. The learner must have the necessary cognitive skills for E-learning (Thinking abilities - able to reason and solve problems, have conceptual thinking abilities, able to make meaning out of newly constructed knowledge, able to reflect, analyse, able to learn).		◆		
b. The educator must have the necessary skills for E-learning (Trained as online facilitator, skilled in the e-learning courses' system administration abilities, computer literate, understands learning styles and preferences, understands the software abilities).		◆		

c. The educator must possess the correct E-learning behaviours (Positive attitude and belief in e-learning, participative, collaborative, possess learner autonomy).

d. The learner must possess the correct E-learning behaviours (Positive attitude and belief in e-learning, participative, collaborative, possess learner autonomy).

e. A plan - incorporating inputs from the target learner group? On how to market the benefits of the intended E-learning course, obtain support for the course as well as how to disseminate information about the course must be in place.

f. The educator must be mentally ready for E-learning (Psychologically ready? all fears regarding the e-learning event addressed).

g. The learner must have the necessary subject matter, pre knowledge or entry level requirements for the e-learning course.

h. The learner must be able to test the innovation during the trial period in a safe working environment with no tracking devices. (Privacy - they must be comfortable with making mistakes).

i. The learner must have the necessary computer skills to operate the computer and the learning course (Technical ability).

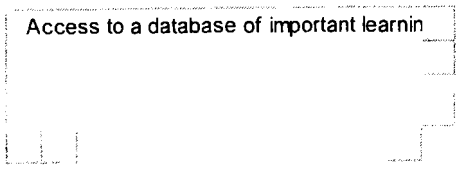
j. The learner must be mentally ready for the E-learning course (Psychologically ready? all fears addressed).

k. Time must be allowed for people who will use the course to change/adapt and get used to it (Time to discover the relative advantage of the e-learning event).

[redacted]

8. Please add any other Human Resource related requirement that you have found through your own experience

to be a pre-requisite before e-learning can commence. Please score this requirement accordingly.



[redacted]

[redacted]

9.

	Strongly Agree	Agree	Disagree	Strongly Disagree
a. The e-learning material should appeal to both hemispheres of the brain. (Presentations should include visual, auditory, kinaesthetic and participative stimulation - must be engaging).	○	◆	○	○
b. The e-learning material must add aesthetic value (Appealing colour, letter type, page length, headings, margins, contrast, positioning of graphics, clarity, alignment, attractiveness, frames, numbering, bullets, clutter, justification, typeface, and graphics).	○	◆	○	
c. The technological infrastructure must be able to support the e-learning event without interfering with the existing load (intra- or internet).	◆	○	○	○
d. There must be a help line for technical support.	○	◆	○	○
e. The graphics used must not disturb download times (Multi media- animation, simulation, visuals and sound).		◆		○
f. The pages of the e-learning material must have the appropriate length.	◆	○	○	○

g. The material must have a printable version option should printing be required.

h. The e-learning site must have an easy access address.

i. There must be consistency in design of all the e-learning modules.

j. The appearance and use of the navigation bars between the pages must be consistent.

k. All hyperlinks must clearly indicate where they will lead and the size of downloadable files must be indicated.

l. The e-learning course must make use of scalable technology (Scalable to any size enterprise. Flexible technology to include groups of workstations or entire organisations. Easy integration with the client's internal systems, delivering media rich broadband experience.

m. Available anywhere, anyplace, anytime to the entire organisation.

n. The e-learning course must be technically simple to use (i.e. simple point and click system of the mouse)

o. The e-learning course must possess centralised tracking and administration abilities (Administrative tools enabling learner assessments, reports, progress tracking, and learner satisfaction evaluation tools).

p. The e-learning course must make use of the most appropriate e-learning delivery system (The particular computer delivery system must possess sufficient processing capabilities (information receivables, - display, - storage, - organisation, - translation, - transformation, - evaluation) and symbol systems (spoken language, printed text, pictures, numerals, maps, graphs) and interactivity systems (synchronous or asynchronous) to support the learning process).

[redacted]

10. Please add any other Technologically related requirement that you have found through your own experience to be a pre-requisite before e-learning can commence. Please score this requirement accordingly. (Add rows should it be required).

Universal design requirements

[redacted]

[redacted]

	Strongly Agree	Agree	Disagree	Strongly Disagree
a. The e-learning design must support the epistemological assumptions of knowledge construction that are supportive of the Constructivist Philosophy (Meaningful learning takes place when there is engaging activity, knowledge generation, collaboration, conversation, specific intention , complexity and reflection).	◉	○	○	○
b. The e-learning course must make use of the most appropriate interaction typology for collaboration and conversation (This includes Synchronous and asynchronous methods used i.e. conferencing, e-mail, billboards, and chat rooms).	◉	○	○	○
c. E-learning course must incorporate efforts to humanise the class/learning group (A virtual space where learners are introduced to each other and share information about themselves).	◉	○	○	○

d. The e-learning course must have appropriate educational activities (Activities that will suit the educational strategy i.e. collaborative work, exercises, projects etc.).

e. The goal orientation of the e-learning course must be unfocused to support inductive learning (Open to many interpretations. Stresses the learner's intentions, experience and metacognitive strategies).

f. The learning material presented must be complex and authentic, and possess experiential validity that is concrete not abstract (The activities and content must reflect the real work environment i.e. a set of related problem cases presented as point of reference. The problems presented are ill structured and complex like in the real world).

g. The e-learning course must provide for any possible/foreseen resources (This includes information banks, text documents, videos, graphic material, hypermedia, links to other interesting and relevant sites etc.).

h. The e-learning course must make use of instructional processes designed for knowledge construction (It uses modeling? the demonstration of how and why to perform certain activities. It also makes use of cognitive scaffolding tools (knowledge construction) to assist learners to organize their thoughts into structured arguments. Lastly it uses coaching - vital information or hints to be used in the completion of the tasks are given to the learner).

i. The e-learning course must be sensitive to the values of various cultures and consider the diversity of the learning target group.

j. The E-learning course must comply with the principles of adult learning.

k. The physical learning environment must be conducive to learning (The place/room/office where E-learning takes place).

l. Face to face contact sessions must be arranged for discussions on any course material.

m. The time spent online must be appropriate to and supportive of the learning process.

n. The course must relate to the character of the subject and the users (I.e. professionals? it must incorporate the character, look and feel of professionalism).

o. Flexible to provide for individual needs (A main learning path to reach the learning goal should be built it, but provision should also be made for alternative learning paths allowing the learner more time on a topic if needed).

p. The course architecture must consist if manageable, appropriate, and logically sequenced chunks of knowledge (Modular design).

q. The e-learning course must be modifiable thus flexible and can be changed (Enough leeway must be given to Educationist to change the course to allow for creativity or changed needs of learners).

r. The e-learning course must be used by the correct learner population group (It is relevant and appropriate at the right time for the right people).

s. The e-learning course should require less adjustment from previous learning experiences (The learning experience must be easier).

t. The e-learning course must allow for learner autonomy and self pacing.

u. An appropriate relationship between transactional distance and learner autonomy must be maintained (The learner and facilitator are comfortable with the balance maintained between the learner autonomy allowed and the facilitative support being given).

v. There must be quick feedback time on any input (communication, queries or work presented for assessment) from the learner

w. There must be an appropriate allocation of time and resources to activities required by the e-learning course (The activities indicate specific people, material & time to be used for learning & technical support. The number of assignments and time provided to complete them is reasonable).

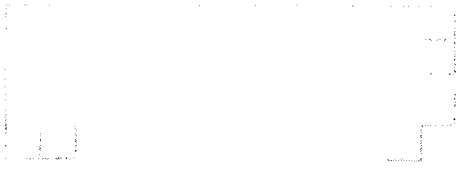
x. The e-learning course must consider the learners' reading and writing skills and language abilities where required (This is especially valuable if the learner is studying in his second or third language. It is essential when the course is intended for a culturally diverse group. It should also consider the visually or auditory challenged learner).

y. The e-learning course must make use of formative assessment focused on strategies or tactics used to construct new knowledge during the process of learning, rather than assessing what the learner knows or remembers.

z. There must be an appropriate match between the size of virtual group participating in the e-learning course and educational strategies chosen (The size has a direct influence on the efficacy of the distance education. It determines what educational strategies to be followed. It influences the type of interaction to be chosen for the course. The size determines the fluency with which interaction takes place between the facilitator and the learner and the learners with other learners or participants).

[redacted]

12. Please add any other Pedagogical related requirement that you have found through your own experience to be a pre-requisite before e-learning can commence. Please score this requirement accordingly.



[redacted]

	Strongly Agree	Agree	Disagree	Strongly Disagree
a. The contact details of the particular business owner of the course must be clearly displayed in the front/beginning (introduction) of the course.				
b. The e-learning course must provide a space for registration purposes where learner particulars and passwords can be recorded.				
c. The e-learning course must have effective security measures to ensure the credibility and authenticity of all information.				
d. The e-learning course must have a published privacy policy				
e. The e-learning course must have published feedback regulations.				
f. The e-learning course must make use of branded educational content (Proven high quality intellectual capital. Timely, relevant and consistent information. Keeping fast-changing content current, dynamic and refreshed. Off the shelf and customised).				
g. The e-learning course must comply with legal requirements as regards copyright laws.				
h. The organisation must have a project team with a clear strategy looking after the development, implementation and maintenance of the e-learning course.				
i. The organisation must have a clear communication structure and strategy to keep all stakeholders involved and to track progress.				
j. There must be a specific official approved time identified for online learning to take place in the organisation.				

k. The steps followed if the e-learning course has been self developed must be correct (Determine bandwidth, do needs analysis, determine content, do rapid prototype, storyboarding, building a production pathway, testing the usability of the course, Quality assurance and testing).

l. The e-learning course must have instructions on practical ways of working online (Specific suggestion should be given to the learner regarding management of his time, technical problems, place of work and study).

m. The e-learning course must improve the quality of the organisations training (Improvement in the range of access to the course. Positive feedback about the course by various specialists in the field. Improved communication and networking opportunities linking a wide range of learners and specialists. Improved record keeping and consistency in training material and method - all sites/learners receive the exact same material).

n. The e-learning course must be efficient (There is no wastage of resources (technological, human and time) or learner's time. All available computers are occupied, all human resources are available and occupied with the course management, all learners are busy all the time during the allowed learning time period).

o. The e-learning course must have Educationist satisfaction (The educationist must be satisfied with the ability of the e-learning program to assist in creating the right learning environment).

p. The e-learning course must have learner satisfaction/support.

q. The organisation must have a plan to evaluate the success of the e-learning program.

r. There must be enough support personnel for subject matter expertise as well as technological needs (A support team consisting of the instructional technologist, Educationist, media designer, programmer, network specialist, subject matter expert, quality specialist and sponsor should be in place).

s. The e-learning course must allow for performance reviews and rewards for good progress and success.

t. There must be wide organisational consulting to integrate the e-learning program with existing technology as well as existing career paths and training matrixes per job category or post requirements.

u. The e-learning course must have reach (All divisions of the organisation share the same objectives and can therefore benefit from one course available to all irrespective of situation).

v. The organisation must have cultural support for online self-study (The workforce is aware of management support for E-learning and its employees are positive towards online self-study).

w. The organisation must have a plan to measure behavioural change and financial benefits of the e-learning program (The workplace/business needs to know to what extent the training adds value to profitability of the company in the sense that it leads to behavioural changes and thus better production. A Return on Investment study should also pinpoint the financial benefits of the training program).

[redacted]

14. Please add any other Organisation related requirement that you have found through your own experience to be a pre-requisite before e-learning can commence. Please score this requirement accordingly.

[redacted]

Please contact rautenba@absamail.co.za if you have any questions regarding this survey.

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APPENDIX C

PHASE TWO: MAIN STUDY

(Direct copy of the survey built with Questionpro)

E-LEARNING READINESS IN THE WORKPLACE:

This is the main study. A pilot has already been done.

Dear Sir/Madam

IF YOU HAVE RECEIVED THIS COMMUNICATION IT MEANS - you have specifically been chosen through panel sampling and your experience and response are considered CRUCIAL in this research project.

TARGET GROUP: Anyone who is involved in or has past experience of e-learning - either being a learner, manager, facilitator or any other relationship as indicated by the survey.

TIME FOR COMPLETION: shortest 8 minutes, average time 16 minutes.

PURPOSE OF THE STUDY: To develop a workplace model for the training of employees in distance education (e-learning).

With this research criteria, or pre-requisites for e-learning are established with which such a training event will have to comply, in order to ensure or at least predict success of the event. You are required to rate the importance of each statement and add your input should you consider it necessary (space is provided).

VERY IMPORTANT: Consider all criteria as if it will apply in all situations. The researcher is trying to determine all GENERIC criteria, knowing that there might be e-learning methods and situations in which some may not apply. The researcher considers this and should one apply this in practice by using it as an audit instrument, one will first determine the applicability of each criterion together with the particular workplace considering the e-learning method used. However, please consider all criteria as if all of them will apply in an ideal situation.

AIM: To establish all possible pre-requisites necessary for e-learning. In other words what needs to be in place before e-learning should commence.

FINAL SUBMISSION DATE: 31 May 2005.

Your participation in this study is completely voluntary. There are no foreseeable risks associated with this project.

However, if you feel uncomfortable answering any questions, you can withdraw from the survey at any point. It is very important for us to learn your opinions.

Your survey responses will be strictly confidential and data from this research will be reported only in the aggregate. Your information will be coded and will remain confidential. If you have questions at any time about the survey or the procedures, you may contact Linette Rautenbach at 082 416 9881 (South Africa) or by email at the email address specified below.

Thank you very much for your time and support. Please start with the survey now by clicking on the **Continue** button below.

[redacted]

[redacted]

1. Please provide your name (optional)

Defne Akinci

[redacted]

2. E-mail address:-

akinci@metu.edu.tr

[redacted]

3. How many years of experience do you have in e-learning?

Less than 5 | 5 years and more but less than | 10 years and more but less than | More than 15

years 10 years 15 years years

[redacted]

4. What is your current relationship to E-learning?(choose only one answer that describes your relationship the closest)

I am a learner making use of e-learning to study

I am an educator/facilitator using e-learning in training.

I am a manager involved with e-learning

I am an Instructional Designer.

I am part of a support team of e-learning courses namely a media designer or instructional technologist or programmer or, network specialist, subject matter expert or quality specialist or sponsor.

Other

[redacted]

5. What is the context of your involvement with e-learning?

University, college or other institution for further education and training.

School for children.

The workplace (any business. industry etc.)

Other

6. What types of e-learning do you have experience in? (YOU CAN CHOOSE MORE THAN ONE IF APPLICABLE).

- [x] Purely online (no face-to-face meetings).
- [x] Blended Learning (combination of online and face-to-face).
- [ ] Synchronous.
- [x] Asynchronous.
- [ ] Instructor-led group.
- [ ] Self-study? Text online.
- [x] Web-based.
- [ ] Computer-based (CD-ROM).
- [ ] Video/audio tape.
- [ ] Self-study with subject matter expert.
- [ ] Other

7.

	Strongly Agree	Agree	Disagree	Strongly Disagree
a. The learner must have the necessary cognitive skills for E-learning (Thinking abilities - able to reason and solve problems, have conceptual thinking abilities, able to make meaning out of newly constructed knowledge, able to reflect, analyse, able to learn).	●	○	○	○
b. The educator must have the necessary skills for E-learning (Trained as online facilitator, skilled in the e-learning course's system administration abilities, computer literate, understands learning styles and preferences, understands the software abilities).	●	○	○	○
c. The educator must possess the correct E-learning behaviours (Positive attitude and belief in e-learning, participative, collaborative, possess learner autonomy).	●	○	○	○
d. A plan - incorporating inputs from the target learner group? On how to market the benefits of the intended E-learning course, obtain support for the course as well as how to disseminate information about the course must be in place.	●	○	○	○
e. Time must be allowed for people who will use the course to change/adapt and get used to it (Time to discover the relative advantage of the e-learning event).		●	○	
f. The learner must be able to test the innovation during the trial period in a safe working environment with no tracking devices. (Privacy - they must be comfortable with making mistakes).	○	●	○	○
g. The learner must have the necessary subject matter pre knowledge or entry level requirements for the e-learning course.		●	○	○
h. The learner must be mentally ready for the E-learning course (Psychologically ready? all fears addressed).	●		○	

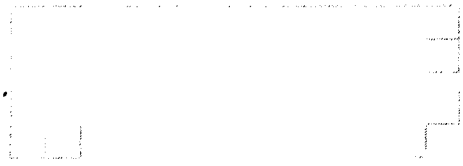
i. The learner must have the necessary computer skills to operate the computer and the learning course (Technical ability).

j. The learner must possess the correct E-learning behaviours (Positive attitude and belief in e-learning, participative, collaborative, possess learner autonomy).

k. The educator must be mentally ready for E-learning (Psychologically ready? all fears regarding the e-learning event addressed).

[redacted]

8. Please add any other Human Resource related requirement that you have found through your own experience to be a pre-requisite before e-learning can commence. Please score this requirement accordingly.



[redacted]

[redacted]

9.

	Strongly Agree	Agree	Disagree	Strongly Disagree
a. The e-learning material should appeal to both hemispheres of the brain. (Presentations should include visual, auditory, kinesthetic and participative stimulation - must be engaging).				

b. The e-learning material must add aesthetic value (Appealing colour, letter type, page length, headings, margins, contrast, positioning of graphics, clarity, alignment, attractiveness, frames, numbering, bullets, clutter, justification, typeface, and graphics).

c. The technological infrastructure must be able to support the e-learning event without interfering with the existing load (intra- or internet).

d. There must be a help line for technical support.

e. The graphics used must not disturb download times (Multi media- animation, simulation, visuals and sound).

f. The pages of the e-learning material must have the appropriate length.

g. The material must have a printable version option should printing be required.

h. The e-learning site must have an easy access address.

i. There must be consistency in design of all the e-learning modules.

j. The appearance and use of the navigation bars between the pages must be consistent.

k. All hyperlinks must clearly indicate where they will lead and the size of downloadable files must be indicated.

l. The e-learning course must make use of scalable technology (Scalable to any size enterprise. Flexible technology to include groups of workstations or entire organisations. Easy integration with the client's internal systems, delivering media rich broadband experience.

m. Available anywhere, anyplace, anytime to the entire organisation.

n. The e-learning course must be technically simple to use (i.e. simple point and click system of the mouse).

o. The e-learning course must possess centralised tracking and administration abilities (Administrative tools enabling learner assessments, reports, progress tracking, and learner satisfaction evaluation tools).

p. The e-learning course must make use of the most appropriate e-learning delivery system (The particular computer delivery system must possess sufficient processing capabilities (information receivables, - display, - storage, - organisation, - translation, - transformation, - evaluation) and symbol systems (spoken language, printed text, pictures, numerals, maps, graphs) and interactivity systems (synchronous or asynchronous) to support the learning process).

[redacted]

10. Please add any other Technologically related requirement that you have found through your own experience to be a pre-requisite before e-learning can commence. Please score this requirement accordingly (Add rows should it be required).

[redacted]

	Strongly Agree	Agree	Disagree	Strongly Disagree
a. The e-learning design must support the epistemological assumptions of knowledge construction that are supportive of the Constructivist Philosophy (Meaningful learning takes place when there is engaging activity, knowledge generation, collaboration, conversation, specific intention , complexity and reflection).	◆	○	○	○
b. The e-learning course must make use of the most appropriate interaction typology for collaboration and conversation (This includes Synchronous and asynchronous methods used i.e. conferencing, e-mail, billboards, and chat rooms).	◆	○	○	○
c. E-learning course must incorporate efforts to humanise the class/learning group (A virtual space where learners are introduced to each other and share information about themselves).	○	◆	○	○
d. The e-learning course must have appropriate educational activities (Activities that will suit the educational strategy i.e. collaborative work, exercises, projects etc.).	○	◆	○	○
e. The goal orientation of the e-learning course must be unfocused to support inductive learning (Open to many interpretations. Stresses the learners' intentions, experience and metacognitive strategies).	○	◆	○	○
f. The learning material presented must be complex and authentic, and possess experiential validity that is concrete not abstract (The activities and content must reflect the real work environment i.e. a set of related problem cases presented as point of reference. The problems presented are ill structured and complex like in the real world).	○	◆	○	○
g. The e-learning course must provide for any possible/foreseen resources (This includes information banks, text documents, videos, graphic material, hypermedia, links to other interesting and relevant sites etc).	○	○	◆	○

h. The e-learning course must make use of instructional processes designed for knowledge construction (It uses modeling - the demonstration of how and why to perform certain activities. It also makes use of cognitive scaffolding tools (knowledge construction) to assist learners to organize their thoughts into structured arguments. Lastly it uses coaching - vital information or hints to be used in the completion of the tasks are given to the learner).

i. The e-learning course must be sensitive to the values of various cultures and consider the diversity of the learning target group.

j. The E-learning course must comply with the principles of adult learning.

k. The physical learning environment must be conducive to learning (The place/room/office where E-learning takes place).

l. Face to face contact sessions must be arranged for discussions especially during the phase of familiarisation with e-learning.

m. The time spent online must be appropriate to and supportive of the learning process.

n. The course must relate to the character of the subject and the users (I.e. professionals. it must incorporate the character. look and feel of professionalism).

o. Flexible to provide for individual needs (A main learning path to reach the learning goal should be built it, but provision should also be made for alternative learning paths allowing the learner more time on a topic if needed).

p. The course architecture must consist of manageable, appropriate, and logically sequenced chunks of information (Modular design).

q. The e-learning course must be modifiable thus flexible and can be changed (Enough leeway must be given to Educationist to change the course to allow for creativity or changed needs of learners).

r. The e-learning course must be used by the correct learner population group (It is relevant and appropriate at the right time for the right people).

s. The e-learning course should require less adjustment from previous learning experiences (The learning experience must be easier).

t. The e-learning course must allow for learner autonomy and self pacing.

u. An appropriate relationship between transactional distance and learner autonomy must be maintained (The learner and facilitator are comfortable with the balance maintained between the learner autonomy allowed and the facilitative support being given).

v. There must be quick feedback time on any input (communication, queries or work presented for assessment) from the learner.

w. There must be an appropriate allocation of time and resources to activities required by the e-learning course (The activities indicate specific people, material & time to be used for learning & technical support. The number of assignments and time provided to complete them is reasonable).

x The e-learning course must consider the learners' reading and writing skills and language abilities where required (This is especially valuable if the learner is studying in his second or third language. It is essential when the course is intended for a culturally diverse group. It should also consider the visually or auditory challenged learner).

y. The e-learning course must make use of formative assessment focused on strategies or tactics used to construct new knowledge during the process of learning, rather than assessing what the learner knows or remembers.

z. There must be an appropriate match between the size of virtual group participating in the e-learning course and educational strategies chosen (The size has a direct influence on the efficacy of the distance education. It determines what educational strategies to be followed. It influences the type of interaction to be chosen for the course. The size determines the fluency with which interaction takes place between the facilitator and the learner and the learners with other learners or participants).

[redacted]

12. Please add any other Pedagogical related requirement that you have found through your own experience to be a pre-requisite before e-learning can commence. Please score this requirement accordingly.

[redacted]

[redacted]

	Strongly Agree	Agree	Disagree	Strongly Disagree
a. The contact details of the particular business owner of the course must be clearly displayed in the front/beginning (introduction) of the course.				
b. The e-learning course must provide a space for registration purposes where learner particulars and passwords can be recorded.				
c The e-learning course must have effective security measures to ensure the credibility and authenticity of all information.				

d. The e-learning course must have a published privacy policy.

e. The e-learning course must have published feedback regulations.

f. The e-learning course must make use of branded educational content (Proven high quality intellectual capital. Timely, relevant and consistent information. Keeping fast-changing content current, dynamic and refreshed. Off the shelf and customised).

g. The e-learning course must comply with legal requirements as regards copyright laws.

h. The organisation must have a project team with a clear strategy looking after the development, implementation and maintenance of the e-learning course.

i. The organisation must have a clear communication structure and strategy to keep all stakeholders involved and to track progress.

j. There must be a specific official approved time identified for online learning to take place in the organisation

k. The steps followed if the e-learning course has been self developed must be correct (Determine bandwidth, do needs analysis, determine content, do rapid prototype, storyboarding, building a production pathway, testing the usability of the course, Quality assurance and testing).

l. The e-learning course must have instructions on practical ways of working online (Specific suggestion should be given to the learner regarding management of his time, technical problems, place of work and study).

m. The e-learning course must improve the quality of the organisations training (Improvement in the range of access to the course. Positive feedback about the course by various specialists in the field. Improved communication and networking opportunities linking a wide range of learners and specialists. Improved record keeping and consistency in training material and method - all sites/learners receive the exact same material).

n. The e-learning course must be efficient (There is no wastage of resources (technological, human and time) or learner's time. All available computers are occupied, all human resources are available and occupied with the course management, all learners are busy all the time during the allowed learning time period).

o. The e-learning course must have Educationist satisfaction (The educationist must be satisfied with the ability of the e-learning program to assist in creating the right learning environment).

p. The e-learning course must have learner satisfaction/support.

q. The organisation must have a plan to evaluate the success of the e-learning program.

r. There must be enough support personnel for subject matter expertise as well as technological needs (A support team consisting of the instructional technologist, Educationist, media designer, programmer, network specialist, subject matter expert, quality specialist and sponsor should be in place).

s. The e-learning course must allow for performance reviews and rewards for good progress and success.

t. There must be wide organisational consulting to integrate the e-learning program with existing technology as well as existing career paths and training matrixes per job category or post requirements.

u. The e-learning course must have reach (All divisions of the organisation share the same objectives and can therefore benefit from one course available to all irrespective of situation).

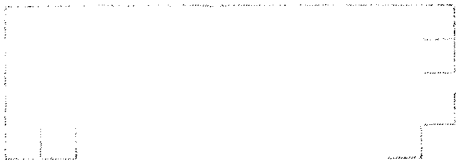
v. The organisation must have cultural support for online self-study (The workforce is aware of management support for E-learning and its employees are positive towards online self-study).

w. The organisation must have a plan to measure behavioural change and financial benefits of the e-learning program (The workplace/business needs to know to what extent the training adds value to profitability of the company in the sense that it leads to behavioural changes and thus better production. A Return on Investment study should

also pinpoint the financial benefits of the training program).

[redacted]

14. Please add any other Organisation related requirement that you have found through your own experience to be a pre-requisite before e-learning can commence. Please score this requirement accordingly.



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APPENDIX D

PHASE TWO: OPEN TEXT REPORT

Q3

Please provide your name (optional)

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5	
6	Lauren Fancher
7	Jan Seabrook
8	ayse gul
9	Caterina Policaro
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11	
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13	Defne Akinci
14	Patti Giddy
15	
16	Amy Scheick
17	Türkan Karakuş
18	
19	
20	Betzi Bateman
21	Dr Debra E Adendorff
22	
23	Sanghoon Park
24	

March

Michael Barbour

Claude Almansi

Mick

Jan Elen

Guolin Lai

Michelle Hinn

Kristeen Lockett

Jim Lockard

Lori Williams

Hasan TINMAZ

Varda

Ann Igoe

Molly Baker

Lloyd Rieber

Theresa Swann

Isaac

Barry Doolittle

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56 tural aliyev

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60 David Le Blanc

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62 Richard Caladine

63

64 Mary Glackin

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66 Debora Adler

67

68 Tom Jonas

69

70 Laura

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72

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74 Bruce White

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76 Tracy Wilbur

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78 Wayne Cotton

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82 Tony Clear

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85 Roger Goodson

86 Herb Dwyer

87 Devadason Robert Peter

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90 Robert Gulick, EdD

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103 Irene le Roux

104 Andrew Scholtz

105 Dr. Manjunatha Keralapura

106 Lynette Nagel

107 Vera Frith

108 Derek Moore

109 Noel Jantzie

110

111

112 Keith Rennie

113 Hanlie Ippel

114 victoria mack

Duan van der Westhuizen

Levent Durdu

johnnie

Kim Mummert

Yasemin Gulbahar

Dr. Kelly Tribble

Wiebke Kuhn

Jason Rhode

Laura Little

George Guba

Brian Leslie

Karen Oates

Judith B. Hale, PhD, CPT

Neil Butcher

Ben Curtis

Chris Olsen

Young Kim

Jon Beedle

Dr. Eugene Kowch

Oma

Mignon Smit

George Kofi Doe

Anthony Marks

Paul Harris

karen thomas

sharon

J. Muffy Pacey

HJ van der Merwe

175

176 herbert thomas

177 Herman Moolman

178 Paul van Zyl

179

180

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182 Pam Miller

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186 Noorminshah Iahad

187 Curt Carter

188

189 Helena Schoeman

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191

192

193 David Golden

194

195 Ruth Burkett

196

197 Jackie Saindon

198 Joe Kramer

199 Saif Altalib

200

201

202

203 Michael Hughes

204

205

206 Claude

207 Kathy Sawyer

208 Odette Schlumpf

209 Mike Johnson

210

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212 Pamela Zinn

213

214 Keith Hopper

215

216 Maryke

217 Generosa Cossa José

218 Bev Keth

219

220

221

222

223

224 Larry

225

226 Ayhan Sehrin

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228 Viola Rosario

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Tanya

Bill Sweeney

Gloria

Clifford Fyle

Paige V. Baggett

jacques

Cathy Gunn

Cindy Hughes

David Marcovitz

Jeff Sievert

Jane Adamson

Barbara Bichelmeyer

J. Muffy Pacey

265 Wendy Hansen

266 Jim Green

267 Jeff Finlay

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270 Kurt Rowley

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272 Haley

273 Larry Simmons

274 Peter Shapiro

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276 Irah Modry-Caron

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278 Corrie Bergeron

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281 Abbie Brown

282 Kimberly D Hall

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285 Louise Delagran

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289 Genevieve

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291 Henry M. Halff

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293 Zane Olina

294 Jason Ravitz

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296 Bruce Jones

297 Soner Yildirim

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300 R Lynn

301 Pam Malcolm

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303 Rodwell Chitiyo

304 Posey Cochrane

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307 sacip

308 Ken Joseph

309 joyce Kincannon

310

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312 Shirley Turner

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315 Lewis

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320 Dr. (Ph.D) Saadiyah Darus

321 Harrison

322 Can Kultur

323 Kinshuk

324 Tim Green, PhD

325 Prof. Timothy Wells

326 Craig Field

327 Michal Giladi

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330 Johan Slabbert

331 Selcuk Dortkaya

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335 Esra

336 B.Brewer

337 G Doyle

338 leslie

339 Cheryl Hodgkinson-Williams

340 Brian Reid

341 Stephanie Jones

342

343

344 Nikiwe Maholwana-Sotashe

345 Richard Walters

346 janette hill

347 Hansjoerg von Brevern

348

349 Madeline Ortiz-Rodriguez

350

351

352 George Warriner

353 Patrick Giroux

354

355

356 Alyson Waterson

357

358

359

360 Saul Rockman

361

362 Girum Tebeje

363 Richard Cornell

364 Jean Vermel

365 Meg O'Reilly

366 Tim

367

368 amanda Summers

369 Judy Trabert

370 Markus Mostert

371

372 refik sanli

373

374 John M. Keller

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376 Jill Ullmann

377

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379 Anne Strehler

380 Nay Thane

381 Marcus Childress

382 Orson Kellogg

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385 Donald Clark

386 Dawn Wright

387 Diana Osborn

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389 Chris Dant

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392 Kelvin Trefz

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395 Curt Carter

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397 NOMBEKO

398 Ruth Geer

399 Cameron Nichol

400

401 Dr. Nor Azilah Ngah

402

403

404 Girum Tebeje

405 Frances Bell

406

407 Eric Hansen

408 Andy Anderson

409 Rob Branch

410 Carole Hunter

411 Sarah B. Odom

412

413

414 David Davies

Vicki Dunnam

VINCENT

Shauna Schullo

Jackie Dobrovolny, Ph.D.

ramon reiser

Salley Sawyer

Q4

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82 tony.clear@aut.ac.nz

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Q6

What is your current relationship to e-learning?(choose only one answer that describes your relationship the closest)

1	currently none
2	I am an educator/facilitator using e-learning in training; as well, I am an Instructional Designer. This section should have had the ability to offer numerous options, as most of us wear several "hats".
3	IT Director
4	all of the above
5	Supervisor of Distacne Learning in a university
6	2, 3, 4, and 5 above
7	I am an Instructional Designer and I am an educator/facilitator using e-learning in training.
8	my title is Instructional Designer, but I handle all aspects of e-learning, from training faculty to use e-learning...
9	R and D
10	not currently involved with e-learning
11	researcher
12	librarian
13	Project Manager
14	Instructional Designer plus support team plus educator/facilitator
15	University professor teaching on and with e-learning
16	Instructional designer & educational researcher
17	project manager overseeing contractor development of e-learning courses
18	I am all these things
19	consultant
20	Combination of educator/Phd student of instructional design
21	A e-learning research student
22	Have used e learning, but am not currently doing so.
23	1 and 2 above
24	Points 2, 4 and 5

25	support
26	Educational Technology Professor
27	I am on a research team working on a Navy project. We are doing research related to distance learning.
28	evaluator
29	all
30	researcher
31	e-L Consultant
32	both learner and researcher on e-learning
33	researcher on how e-learning is integrated into the school curriculum
34	student involved in e-learning projects
35	government strategist for elearning
36	I am several of the above but the question only allows me to select one.
37	Evaluator/Researcher
38	I am learning about e-learning not that much using e-learning
39	Educator using it and instructional designer
40	I am a learner making use of e-learning to study and advisor as well.
41	Writer
42	Manager of e-learning in a corporate setting, systems architect and instructional designer
43	librarian
44	I am only a post gratute ICT student taking courses about the e-learning.
45	educator using e-learning in education
46	I teach others how to use e-learning in many different ways. I am also an educator that uses e-learning in my own area of expertise (instructional technology)
47	all of the above

Q8

What is the context of your involvement with e-learning?

1	University and workplace
2	a non profit association offering training at distance
3	University, college or other institution for further education and training and school for children.
4	online volunteer tutor
5	both university AND the workplace
6	university context to recommend guidelines for military training
7	non-profit
8	all of the above
9	first and third option
10	All of above
11	public lands interpretation (natl parks, forests, etc)
12	I work in an office but design e-learning for school children.
13	Masters
14	online high school
15	Country/System-wide strategy
16	all of the above
17	Web Site
18	none as instructor, but I have taken classes online
19	In the University learning about it.

Q10

What types of e-learning do you have experience in? (YOU CAN CHOOSE MORE THAN ONE IF APPLICABLE).

1	Interactive television
2	OJT
3	streamed audio and video
4	collaborative
5	you need to define e-learning for respondents
6	games
7	exhibit kiosks
8	television
9	video-live
10	Cooperative learning, peer learning and evaluation
11	2-way interactive video
12	Collaborative learning, cooperative learning, Peer education, group work and evaluation by gruop members only facilitated by the facilitator.
13	progtrammed and other text books, audio tapes, professional continuing education seminars, telephone language training practice, broadcast television --all these in blended training for both robotrics engineers and linguists.

Q22

Please add any other Human Resource related requirement that you have found through your own experience to be a pre-requisite before e-learning can commence. Please score this requirement accordingly.

1	
2	
3	
4	
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6	The overall organization must promote and support elearning as a strategy for workforce development. People must be exposed to opportunities and benefits.
7	Learner needs to have knowledge of, and be comfortable with any scoring system and where results go and who sees them.
8	learners' self efficacy is important: agree
9	.
10	
11	I don't feel I can answer any of these questions as they all depend on the context. I've worked on various projects and the obstacles in each case are different. It's also impossible to precisely predict the impact of certain changes, so hard to evaluate their exact degree of importance. Also many of the statements are sufficiently vague that saying that I agree or disagree would be meaningful as it would depend on various things.
12	
13	
14	Good, if not excellent, computer and Internet accessibility (otherwise may lead to frustration and loss of interest). Strongly agree
15	
16	
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18	

19

It is not always necessary to have all pre-requisites in place. Learners have to start somewhere.
20 However, it is important that the online facilitator can handle these various situations. My study showed that the online facilitator should fulfill five roles. I agree to this.

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comment on 7, rather, as to the tech preparation of learner and educator: Of course some basic preparation is needed, but A) good, almost fool-proof software can enable even relatively
30 competent people to use it; B) people should know that a glitch is always possible. We can discuss this further by e-mail if you wish.

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Strongly Agree: Learner must have strong self-regulatory skills.
36 Strongly Agree: Learner must be able to communicate through interactive activities, and feel comfortable developing "relationships" through digital means.

Organizational commitment in terms of funding, resources, support mechanisms, and promotion of the e-learning project within the organization from those at the top. I believe you also need the
37 support and commitment of other well-regarded people within the organization who will also publicly promote the effort.

38

39	
40	just in time support -technical and instructional design if the educator is to design/or modify the course non-evaluative support
41	
42	Can't understand part d. The rest are about the learner and the educator.
43	Unless you are prepared to pay your way through the e-learning course, you need to get the facts on how your company will reimburse you for the tuition you paid before you start.
44	
45	
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47	research ability of learner and the instructor's directions plays significant role in e-learning
48	
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51	While attitude is important, more important is an highly accessible help desk
52	
53	
54	the learner must see the relavance of the material to be learned, that it is applicable to their life, and that it will be beneficial to them The users' (both instructors' and learners') computer systems and Internet connection must be in good working order. I have started many courses only to find that a good percentage of learners cannot optimally access course materials and activities due to spy-ware, ad-ware, and viruses present on their home system which impede participation.
55	Support materials including online tutorials are often needed to assist certain learners in using productivity tools such as spreadsheets, presentation programs, etc. Tutorials might also be provided to assist those learners who lack what would be assumed to be pre-requisite knowledge (techniques of using a search engine, etc.)
56	
57	

58 Learners must have an environment that supports e-learning (ie. family, friends, supervisors, colleagues who respect the value of e-learning)

59

60 I think that one of the most important learner characteristics for an online course is reading ability. Many of the college students that I teach have trouble reading. I find that one of my essential roles as an instructor is to make the information in the textbook understandable to students. I would rate reading ability as absolutely essential.

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65 peer support and institutional support/recognition

66 The educator must possess good time management skills enabling him/her to provide feedback to learners in a timely manner.

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71 Strong support structures with well trained staff must be in place to address technical problems S/Agree

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85 The learner's basic psychological needs for positive relationships need to be addressed with face-to-face and/or online communities of learners.

86 I assume it is difficult to exclude learners without the necessary skills who could aquire these (would make educators role easier but may exclude many learners).

87

88

89

90

91 aptitude for learning and share the learnings with others

92 The learner must have
1. a technical support network on hand.
2. co-learner(s) readily accessible either f2f or electronically.
Rating for both: strongly agree

93

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96 The technical support must be adequate, and reliable particularly in terms of the storage of the learners' assignments.

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100 Interactive group discussion is effective. Moderator not always necesary - some moderation is good and some awful

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110 self-motivation,eagerness

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122 The student must be self-directed and have the ability to organize time balancing work, study, family, etc.

123

124 Learners' cognitive skill requirements depend on the specific learning requirements. Your requirments in "a" are a good idea, but may not be required in all types of e-learning. Learners may obtain subject area knowledge, & develop mental readiness & positive attitudes with instructor support. It's nice to be completely ready but I doubt most instructors or learners are. Other learner skills that may be required/developed: time management, communication, collaboration, information literacy, critical thinking.

125

126 Political and organizational factors can strongly affect the success of any e-learning initiative.

127 The capacity for teaching and learning through e-learning can vary from person to person for both educators and students. I have seen students go from lower levels of understanding and computer skills to fully grasping higher levels of learning due to engagement with the environment, other students and the instructor. This same situation can also hold true for instructors and developers.

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133 Very few of the points above are actually about "e-learning" - all points apply equally to any form of learning

134 Motivation, but you might be considering this in (h) and (j).

135 Too much emphasis on fear. Fear is not the big problem for learners; the big problem is boredom or lack of motivation. If the e-learning is relevant and answers real needs, most students will overcome fear and other problems.

136 It's not a matter of learners willingness to use and learn from the e-learning system, it matters much more that the learners are willing to learn.

137

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139

140 All student support services (tutorial assistance, admin, etc) must be in place to support e-learning

141 This is a very biased instrument - you prescribe very specific cognitive skills and expect agreement.

Same with behaviorist questions. What is 'mental readiness', etc..

142 as with most organizational change, incentives and rewards must be aligned with the desired change of behavior

143 Contingency plans must be put into place if technology fails. For example, in Florida, hurricanes can cause outages. If deadlines have to be met, then provision has to be made for learners to accomplish their goals due to technology failure.

144	The organisation must be ready for e-learning, thus there must be adequite support for learners, e.g. technical helpdesk. (1)
145	The atmosphere must be conducive for Learning. Physiologically the learner must be prepared without noobstructers.
146	Willingness and freedom to try everything and learn from the trial. Editing the attempt until satisfied with the new skill mastered iteratively.
147	
148	
149	
150	Some of the above statements say more than one thing. I have therefore wanted to agree with some of the aspects and disagree with others. Other statements include aspects that has nothing to do with elearning but rather with ALL kinds of learning, such as the ones on the cognitive skills of learners and pre-knowledge. Furthermore it would have been wise to have a questionnaire such as this one (with an ITForum audience) language edited.
151	
152	na
153	A student must have some basic experience using the computer, emailing w/ attachments, Internet, etc.
154	
155	Do not have @ this stage, just a comment: a disagree or agree above is actually very difficult. take the trial period for example. I agree with the innovation, safe environment and practise, I do not agree with "no tracking" where they are in some sort of comfort zone and so can I qualify all my agrees + disagrees ...
156	
157	
158	The most important factor in my view is motivation - and linked to that an extrinsic need to make use of the intervention
159	Thorough needs analysis wrt to the readiness of the learners to use e-learning. (Strongly agrree)
160	

161 Work loads of lecturer and learner must allow for sufficient time to devote to the e-learning course. Strongly agree.

162

163 Be prepared to try and try and ASK if there are problems. They need humility and courage to say 'Help'.

164 Work loads of lecturer and learner must be such that sufficient time can be allocated to the e-learning course.

165 The learner should be aware that in an e-learning environment, they will be a bit isolated. However they should also realise that there are many means where they can communicate with others.

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182 Clear definition of the expected outcomes (e.g. competencies as learning objectives) - Strongly Agree
Agreement between educator and learner about the expected outcomes (e.g. competencies as learning objectives) - Strongly Agree

183

184

185

I think that while most of the above are desireable, there are a number that are not absolutely
186 necessary. Sometimes persons, both instructors and learners, can limp through without all prerequisites being met.

187

Comments:
Learner autonomy in e-learning is something the course designer must make provision for. It is not dependant on the learner.
188 G.Subject matter pre-knowledge is the responsibility of the educator. In e-learning, some of the pedagogic principles remain the same as that in f2f. I stronly agree with entry level requirements as pertained to mental readiness and the necessary basic computer skills, even if the learner is far from being the expert.
f. I perceive the two statements as different. I agree to privacy.

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200 I feel that without interaction in a class environment, the instruction must be designed in manner that learners find it interesting. Just textl gets very boring and effects the learners outcome.

201 Motivation and the establishment of the feeling of not being alone in the virtual learning environment

202

203

204

"Learning styles" are irrelevant because they cannot be reliably measured or assessed and changed constantly - and your description of 'readiness' seems inane. Students routinely succeed in acquiring skills and knowledge they later apply on the job competently when all they had was the technical skill, the prerequisite knowledge and skill, and the motivation of keeping a high-paying job (cost/benefit ONLY). Warm fuzzies are invented by people who can't or won't address
205 critical components like the tech/computer skills and prerequisite knowledge as well as internal critical components like prerequisite order of instruction, sufficient and spaced practice items, effective instructional feedback (not patting students' heads!) and other sound instructional design and development practices based on reliable, valid, and replicable research. I've never seen the good stuff fail and never seen (even once) the poor quality garbage-labelled-as-instruction succeed.

206 I think the institution that provides the e-learning experience needs to be the most ready.

207 Support of supervisor

208

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215 The lerarners must must be ready to learn on their won and must also plan to meet deadlines of assignments and completion of modules as the scheme may require.

216

217

218

219

220 Die student moet presies na wie om te kan gaan vir watse hulp. Bv, akademies of tegnies.

221

222 Design of e-learning acitivites must accommodate learner needs and reflect objectives - whatever these may be - most important.

223

224

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227

228 The educator must be "available" and provide the learner with an expected time-frame for a response.
Strongly Agree

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235 Strong, clear organization of the course is a must. Quick feedback to individuals to clear up uncertainity is a must.

236

237 The learner must have a reason to learn (learning is work and requires effort). This reason could be extrinsic or intrinsic.

Strongly agree

238

239

240

241 We found that learners need the support of their manager, who will allow the time to take a course and who will follow-up with learners so they use the knowledge.

242	Educator must have strong ideas about how to match subject matter with appropriate technologies (strongly agree) Learner and educator must enjoy adequate support in the online environment (strongly agree)
243	the course must have high relevance to the learner
244	
245	
246	
247	There must be a high degree of communication between four aspects of the e-learning system: 1 - Learner and instructor 2 - Learner and learner 3 - Learner and institution 4 - Learner and instructional material and content
248	
249	While you mention neccesary requirements, I disagree with what is listed as neccessary. While there may be requirements, they are not the ones listed.
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262	the educator should be a good communicator and LOVE sharing knowledge. Flexibility and organizational skills for both are important.

Good instructional and interface design that compensates for learner limitations and increases positive attitudes.

Apply a motivational model to online learning.

Course must have effective design and structuring of activities to promote learning interactions, should be set up to avoid information overload, the educator must have strategies for facilitating online discussions, and there needs to be an assessment strategie as part of design and expectations...etc...

Must be someone readily available to ask questions while learning course material.

286

287

Lack of entry level skill/knowledge need only delay start of learning. A self-administered pretest can lead learner to pre-reading/required skills development.
288 A willing but unskilled learner can be enthused to adopt belief in e-learning etc.by well designed learning activities .

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290

Extensive use of end-user representatives during planning and development of the elearning
291 experiences.

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e-learning is a special category of "learning". Pedagogy is the first and foremost. All that you do to provide good learning experience (from both teacher's view and student's view) should be done in e-learning. Things like providing safe working environment with no tracking make no sense. If
295 tracking is not good, then just don't do it. Provide safe environment all the way through. Respect privacy all the way through if that is good. If that is not good, then do not start with it. Learner is a learner from the beginning. Necessary cognitive skills development should be part of e-learning all the way through, as it is in ant other form of learning.

296 Support for both students and learners

297

They must have the get-up and go inside of them for online learning. If you do not contribute, or
298 have the discipline to log in and get involved then you will fail.

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The learner must be aware of time management and put aside time regularly to access and
300 participate in the subject

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There should be a support group to assist faculty new to this process. This is vital if the process is to grow. There should also be technical support people ready to help with installation/support of e-
315 learning tools,
There should be a group on campus able to evaluate new deveopments (products, applications) as they appear on the scene.

E-learning specialist i.e. one with e-learning expertise should always be ready for to address all e-
316 learning related problems (be it the learner's attitude or educator related problem and should provide as much support in all the e-learning programmes (strongly agree)

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318

319 I believe the most important thing for e-learning to succeed and flourish is upper management support.

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329	both learner and educator must undersatand the rationale for participation in the e-learning
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331	The issues raised are either those that "should" be prerequisite; however, part of being involved in e-learning means that the learner will also be afforded the opportunity to learn, including the desirable attributes needed for successful e-learning.
332	The learner must be aware of the demands to be made on him for independent work before the course begins.
333	robust reliable technology - strongly agree
334	
335	i think that a mixture of backgrounds and knowledge is a neccessity for elearning experiences and practices
336	
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338	mANAger of the elearners need to buy in / be positive as well
339	Regarding the ones I disagreed with, I think that while it would be desirable to do these things, it isn't necessary and that much of this can be handled with the introductory material and experiences in a course.
340	
341	
342	This survey assumes a "must" attitude. Learners can adjust once they are in a situation -- is it the best way to approach? No, but certainly attainable. Same with an educator. If we waited until everyone was "comfortable" and trained, we would have very few online courses. Educators frequently jump in and teach online without any pre-knowledge of the online needs of students. Some are quite succesful anyway, as they pick up as they go; others can be trained and possess the pedagogy and never get the idea.
343	
344	
345	none

I would strongly agree with "j" if it addressed motivation to learn. This psychological dimension outweighs virtually everything else, at least with adult learners, in my expereience.

Strongly Agree: After completion of the e-learning course, the learner must be given written documentation or a place where they can review and refer back to the information presented in the e-learning.

Learners must be given time to adjust to the online environment through exchanges & questioning

Learners are there to learn, if they have the ability to think constructively prior to taking the course, that's fine but as an educator, you must create a course so that learning can occur. There must be enough motivation for learners to be online to learn, otherwise the drop-out rate will be very-very high.

369

370 Teh obvious one is access - bandwidth is a big issue that I've had to deal with - not beign able to access a course for months at a time due to slow connections.

371

372 student must be a self starter

373

374 The way you've phrased many of these questions they could equally apply to learning in general. I'm not sure if these are therefore drawing out issues relating specifically to e-learning. Also, some questions are too closed e.g "learner must have the necessary cognitive skills for E-learning". In what way are these different for e-learners vs traditional learners?

375

376 They must be willing to set personal goals to complete the assignments

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382 Management support

383 There needs to be a willingness to learn something new (applies to both the instructor and the learner.) [Strongly agree.]

384 The material must be able to visibly be relevant or else enticing enough to bring in the reluctant student. The material and authoring system should be quite intuitive and sensually and cognitively attractive. If it requires special training to administer, it will only rarely be used.

385 Both student and instructor must believe that eLearning is a valid and effective learning environment

386

Q15

Please add any other Technologically related requirement that you have found through your own experience to be a pre-requisite before e-learning can commence. Please score this requirement accordingly. (Add rows should it be required).

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6	work on both mac and pc; and not rely on plugins or special browser configurations
7	Too many MUSTs in the above questions - e-learning needs to fit the need it addresses, eg it may need to be available anytime, anywhere, anyplace - or it may not. Similarly a variety of question types or activities involving more than point and click systems can be used for technologically advanced learners.
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20	Practice time for learners - they should be able to 'play around' to familiarise themselves with all the hardware and software, before the course starts.

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24 On K, not ALL links should be identified. Just those that are likely because of their size, to produce a delay

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30 i, m, n & o depend to some extent on client/audience requirements

31 Where did you get the "both hemispheres" item? There is no empirical basis for this.

32 The technology should be as invisible as possible. (strongly agree)

33

34

35 It is difficult to satisfy the sometimes conflicting requirements for both a rich multimedia experience with simulations, animation, etc., AND quick download time. If learners are to be able to do their work at anytime and from anywhere, you often cannot control the bandwidth from where they are.

36 Strongly Agree: The e-learning environment must be as seamless as possible, so as to not interfere with the cognitive load of the learners.

37

38 Note on 9: I have no experience of e-learning in a business context, so my answers to 9 are theoretical. In a business context, coherence of the appearance is perhaps more important than in more informal contexts.
re o: we discussed the tracking advantages vs privacy at the Swiss "Forum New Learning", about WebCT, a couple of years ago (www.fnl.ch but the platform is pw-protected, unfortunately). I'm in favor of a more informal and flexible form of monitoring and assessment than, again, WebCT. For instance David Warlick's S.L.A.T.E , combined with a student's blog (or a diary anyway)

39

40 STAFF in sufficient quantity and with quality of skills to supply support

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43 Use only technology required to complete the LOs

44 You need another means of communicating with your professor or advisor other than the use of the email. A cell phone is necessary if you feel the answer you need is better explained verbally.

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49 must is too strong- would be nice or ideally is preferable

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52 The help desk is of paramount importance. Other aspects of the system can, and will fail, but if learners feel they have access to an efficacious and timely help desk the failures can be accepted

53

54 leaner should be oriented to the e-learning experience, for example, how to use the technology involved, how to access the sychronous chat rooms, where they will recieve their email from, etc

55 Alternative interface/interaction choices should be available to learners to decide whether they will use heavy bandwidth media (Multi media- animation, simulation, visuals and sound)versus text-based interface.

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59 I have disagreed with most of the above in this section because of the word "must". Most a desirable but not essential in my view

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65 Technical system should include all elements of communication necessary rather then relying on other systems such as separate e-mail systems.

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71 Your survey is difficult to answer as it assumes a single e-learning system whereas in fact there may be several different resources applied in many distinct ways. Do you imply a specific LMS or a suite of training materials??

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86 Difficult to disagree with any - but importance is about the balance not one feature.

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91 The above are all general instructional design principles. I would not label them "technology". Under technology I would address issues like hardware requirements, training in the use of communication tools, accessibility of resources like extra reading, browsing for more info etc. Beautiful instructional design does not guarantee that learning will take place.

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99 Discussion boards and forums must be easy to use. Feedback to the educator should be both on web board but also need to have email access to educator

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108 Forced choice questions with insufficient choices.

109 The technological tools of the user/learner should be sufficient or the system should be consistent with the tools of the learners.

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121 The most important thing is to state the reality of technology, access and make sure that the instructor, learner and technical support meet expectations. If a learner does not have the technology and access to participate... they should not expect the whole experience to be brought down to their level.

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123

124 It's nice to have appealing webpages, but not required if there is sufficient learner motivation. What is appropriate length (f)? All my Agree answers indicate that I think these attributes are desirable, but that elearning could be successful without them. Not sure I understand all attributes of P.

125 Instructors and course designers often need more technical support than students.

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130 Although 9. a. is a srong goal for e-learning it is difficult to achieve. In many e-learning environments the developer is on their own, often having to depend on their own abilities with varying levels of support. However in an integrated team environment and if possible with support from the publishers whose texts are chosen for the courses, a greater level can be achieved. But despite that, there are additional limitations that are presented by the learning environment, access issues, materials available, time and resources.

9. b. In my institution, we have made an institutional wide emphasis to improve the quality of distance learning materials. There are several ways that we have pursued this. The most visible is in the area of graphic design. Most forms of e-learning are still mostly text driven. By use of formatting, images, graphics, etc. the perception of the quality of materials increased.
9, c & e. In a perfect world, these demands can be met. With broadband, these goals are more easilly met. However this is not often the case with technology at its current level. Although all media should be optimized for a variety of delivery modes, the truth is that some materials will take longer to view. However if that is built into the expectations for the students, there is less problems. Visual content can be very important in an online course and should not be sacrificed for speed.
9. k. Hyperlinks do not necessarilly need to indicate where they will lead. However they MUST be relevant to the content within the course. We have several approaches to the use of hyperlinks within our courses. The primary ones are 1) integrated links; 2) using links for supporting content; 3) annotated links; and 4) support links. Integrated links need not necessarilly have link information contained on the page, however the links must be carefully chosen to support and promote the information in the content without detracting or directing the students away from the course. Good examples are linking to definitions, linking to clarification, and linking to additional information on a point. Links for supporting content should be separate from the text or should be designated as such i.e. "for additional information, see..." In this case you will want to post the title and address of the resource. Annotated descriptions of materials can be very efffective. This is often best used for supporting materials but if you provide additional pages for course links you can also use this for the embedded content links. The annotations provide additional information and pertinence. Support links are those designed as informational and/or additional training support such as: technical support, tutorials, education support sites, online writing center, etc.

131 Some of your questions did not make sense to me (p for example) and many are dependant on users and goals of learning. I work in an environment that segments the learners (for example classified vice unclassified) that makes the availability decisions dependant on the security requirements of the content/end users.

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133 Should be accessible to persons with disabilities.

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135 Some questions answered Disagree because of the way the question is worded (e.g. "must")(items a,b,i). Item g. Don't understand question, If printing is required, then the course must include that capability. Otherwise, a printing capability depends on a variety of factors. General comments: My answer to most of these questions would be "it depends." I think technology will make most of these irrelevant in the near future.

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139 These questions are too general - they apply or do not apply in too many e learning contexts and applications.

140 Be ADA compliant (for people with disabilities)

141 more than engaging, must engage emotions as well as brain
you use "appropriate" a lot without defining it in each instance, my responses could vary with how you define appropriate versus how I might. I think this is a weakness of the experimental design

142

143 Most companies have a dedicated e-learning time for courses e.g. e-learning traning centre, as learnign DOES not take place at the desk during office hours. Schedule for e-learning course, book time out and go to the traning centre for traning. (2)
Company tech ological infrastructure must be capable to handle the learner volumes e.g. ABSA 2000 users can log-in at once!!(1)
People are not bothered by download time anymore, only frustrated by it. (2)
WHat about cellphone technology WAP etc. that is also e-learning but not web-based. (2)

144

145 Broadband or ISDN are highly recommended for web-based assignments, though not absolutely necessary.

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149 Backup systems must be in place in case of technology failure.
What is meant by 'the appropriate lenght' in requirement F? Appropriate by whose definition...

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151 na

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154 Again very difficult to give a yes/no. In some cases I just couldn't decide ...

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157 Scalable technology depends on the scope of the original appklicability as encompassed in the planning documentation

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161 The computer system must be robust and have no down times as that really upsets things. If with Internet connection, the bandwidth of the clientS must be good enough to support the course, all clients.

162 User training and/or help files should be available.

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178 The e-learning course should not require technology that does not add instructional value -- Strongly Agree

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181 There must be options for students and educators to manage their subscription to asynchronous discussion lists (e.g. the option to receive daily digests or individual emailed prompts of articles posted to the list). Strongly agree!

182 There should be a clear listing of the minimum prerequisites for the various end-user components that are specified "up-front". Also, there should be very easily accesible downloadable resources with instructions about how to down load them AND install them on the basic platforms.
There should be a web page that provides a test connection scenario so that the end user can determine sequentially the follow:
1) Connection to the system - with choices for various connection modes: phone dialup, cable or DLS modem, or broadband/ethernet.
2) Web browser success
3) Audio transmission
4) Animation success
5) Interaction success
6) Synchronous tools like chat - text and audio

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Several of these questions are inane and several are worded so badly that they (and therefore the answers) are likely meaningless. You need to read the research about brain hemispheres rather than perpetuate the myths. It's not the aesthic value of the graphics that matter - it's the instructional value. Also, how can anything 'disturb' a download time- by annoying it? Anyway, graphics and other components should always (out of consideration of the student) be as lean as
201 possible while still effective. If a necessary simulation takes time to download, then the student can show some patience or give up - the designer should include the necessary components but communicate the download requirements in advance so students are prepared and have appropriate expectations. Your questions don't seem to address the balance between meeting learner needs within the reality constraints of the business/instructional situation. That's paramount and critical and nothing else successfully substitutes for it -- ever.

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209 Educational softwares with turorials must be handed out to learners

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All e-learning courses should be designed so as to be accessible to the maximum possible number of students, including people with disabilities (strongly agree)

All users must have relatively high-to-date computer system. Slow computers can create a barrier to the e-learning experience. So, minimum system requirements must be established.

What is "appropriate length?" *Decorating* material to make it "more interesting" backfires. Appropriately *illustrating* material to provide multi-sensory encoding pathways works.

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In the real world, you can't say a project must have this or that--you have to look at your
254 resources and limtations and the goals of the project. Some project require tracking--for others it is an unwarranted expense.

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I like email "push" technology, but I wouldn't require it of a system. I.e., where you can participate via email, without having to go to the web.
259 Any design places limitations on what you can do. E.g., if it's not available anywhere anytime, you do what you can do...

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281 The above items emphasize technical aspects too much without indicating at least comparable emphasis on kinds of learning expected.

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283 I had problems in answering many of these questions. Once again, the technology should support learning. For example, if something will be printed, do not put it online (unless you want to provide proper search facility). Give them print. Printing in bulk is much cheaper rather than each student printing it separately.
Technology should support learner attributes and pedagogy. For example, aesthetic value should be there not because pages should look fancy, but because pedagogy requires proper look of content for better understanding. Appearance should be consistent not because it should look good but because this will make interface familiar and reduce meta-learning load. The system should in fact be as transparent as possible so that learners focus on subject content and not on the medium.

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My rule is KISS - Keep it simple, silly! :-)

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317 Basically this question addresses instructional design concepts and, for the most part, I feel that these are cruical to good course design. Some may not be as cruical but most, in my opinion, fall in either the must or should have categories.

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321 elearning must be careful when using graphics so that they do not offended certain cultures. some animals mean bad luck in some countries and good luck in other. elearning must be culturally aware of their teaching groups.

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323 . The leaerners/trainees should have easy access to the technology / computers.

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331 none .

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333 I don't see anything in the survey yet about accessibility to persons with disabilities, nor about universal design, although I do see some aspects (e.g. the ability to print) mentioned. I think that the requirements of accessibility and universal design are so important that they come first, i.e. strongly agree.

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336 The system requirements must be clearly stated if use is going to be on non-company/university owned/controled computers. - strongly agree

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339 - Compliance with Section 508 / ADA and the corresponding EU / international regulations: strongly agree.
Comment: many of the questions on this page should have been phrased in terms of the appropriateness of design and technology to the audience, content and infrastructure. A, B, C, etc. are phrased as absolutes when design and infrastructure are instead weighed and decisions are based on informed compromises.

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343 Graphics, including ppt, text or document files and Web pages must be sized for excellent visibility. SA

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348 Must be able to use the characteristics of the delivery mechanism, not just cut and paste from normal classsroom interaction.

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some of your 'musts" are more properly 'shoulds" that is learning can take place without them but they are desirable

Are your questions really getting to the heart of e-learning issues? For example, by agreeing that e-learning should make the most of the delivery system - who would say no? Some questions need a 'it depends' response as it really does depend upon the nature of the material being delivered. For example 'The e-learning course must be technically simple to use (i.e. simple point and click system of the mouse).' - were you thinking of more complex non mouse-based interfaces such as voice recognition?

Q18

Please add any other Pedagogical related requirement that you have found through your own experience to be a pre-requisite before e-learning can commence. Please score this requirement accordingly.

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5	content should require some engagement, not just screen reading, but does not necessarily have to be a 360 degree constructivist approach
6	There seems to be a prescriptive process here -where is creativity for the educator?
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17	Learning online takes much longer. Allow for assignments to be completed over a weekend. Pay special attention to how learners are grouped together.
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21	Your descriptions have relied heavily on what "must" be. Most of the ideas expressed are nice but not absolutely necessary. In other words, "must" is too absolute a term. Only one case of one

student successfully learning by reading old lecture notes makes a case against every "must" in the list.

I really had a hard time replying to these questions in this section because many were worded in such diametrically opposite ways. For example - The learning material presented must be complex and authentic, and possess experiential validity that is concrete not abstract. Why should one have to choose between abstract and concrete? Why can't you have both when appropriate? Sometimes it's important to have a conversation about the underlying values and principles of a particular concrete action.

Sorry,
I tried to help but your questions are far too confusing. You seem to be confusing a "course" with a "course management system." Course management systems already contain all the possibilities that you list. The course need not provide those.

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The e-learning course must provide for any possible/foreseen resources (This includes information banks, text documents, videos, graphic material, hypermedia, links to other interesting and relevant sites etc.).

45 i think above question is not so good because in e-learning the instructor just gives the directions to learners and they have to find related information not just open and read as in traditional learning environment. in an e-learning environment, learner has to have research opportunities and skills not just learning from the ready materials. research is important in e-learning environment...

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The alignment of pedagogical related aspects is important - and learners will discover inconsistancies.

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95 Your use of 'must' makes a nonsense of almost of all of the questions above.

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97 Forced choice questions with insufficient choices.

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106 THe only concerns that I have is that not all e-learners are adults. Some are traditional aged high school and college students. I think that behavorist strategies can work if that's the teacher's philosophy (Personally I'm more constructivist, but I believe either way can work if it's done well.)

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109 In response to "A," do ALL e-learning courses must follow the constructive philosophy? Not necessarily - depends on the nature of the course. There is a vast difference between teaching an algebra course versus a literacture course.

110 On physical learning environment - the beauty of online learning is anytime and anyplace. The learner must take some responsibility for identififying where and when he/she will participate.

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I interpreted R as learner entry skills. Again, Agree ratings indicate I think these are desirable but
113 that learning can be successful without them. V: sometimes instructors can stifle learning/discussion by responding with "right" answer too quickly.

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12. q. We are currently playing with an 80/20 model for certain courses. The core content and
118 structure is 80% of the course materials and the individual instructor has flexibility over 20% of the course to make modifications to assignments, discussions and/or add additional commentary.

Really have a problem with using the term "must" in most of the questions. Many time learning takes place in less than ideal circumstances if the motivation is strong enough, or some other
119 driving force (safety, promotion, etc.) overcomes some of the deficiencies. Many of these questions are dependant on level of learner (novice, master) and on whether you are referring to training or education.

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There should be a close correlation between the objectives of the course and the learner's immediate needs on the job or development needs, and this correlation should be clearly
124 communicated.
Bells and whistles and gratuitous graphics should be used with restraint. They quicly become irritants.

125 v. There must be appropriate feedback time, the timing mutually agreeable to both learner & instructor.

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127

128 all this "must" means I must disagree. I think it facilitates, but people learn under the most amazing constraints...I should think 'should' would've been a better choice of phrase

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130 What about reusable objects and the use of metadata to index online courses? (1)

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141 Being a student first before becoming the facilitator or manager (teacher) in crucial!

142

143 THOUROUGH TRAINING OC FACILITATORS SHOULD BE CONSIDERED

144 It is a myth that constructivist epistemology necessarily underlies e-learning interventions - similarly the extent to which cooperative learning should take place is determined partly by the content of the module and partly by the expertise of the participants.

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149 The e-learning course must engage the learner by adding value to the learning experience, over and above what can be accomplished by other means of delivery.

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For many of the points above, I felt constrained by the word "must" as the verb form. Sometimes I even disagreed because of that word choice. If the verb had been "should" I would have felt more comfortable - indicating an ideal, but something which might not necessarily occur given the contingencies that invariably arise.

g. Learners need to have help, but they also have to have choices to help them feel that they are in control. If they are spoonfed, then the motivational factor of efficacy is either weakened or destroyed. Supplying learners with need to know and nice to know sources, allowing them to choose from even the need to know sources will help.

Choices of technology and pedagogy need to fit the learner group and the nature of the course being taught.

E is poorly worded; my disagreement is with the premise that fuzzy goals cause what you claim - fuzzy goals indicate incompetence of designer and are a disservice to the student. How would YOU like to be held accountable to a goal that was not clearly communicated to you? How would YOU like your raise or promotion to be based on criteria that were kept secret from you? F is like many of your items - in many cases it is appropriate but not always, even for adult learners. If the adult learners are complete novices, this may not be appropriate for the first course so why word the question so badly and so inappropriately? G is pretty much a fantasy, even might Intel Corp. can't do this so who can? The choice of the word 'must' in E, like I and K, is not appropriate. It's preferable for everything to be the best, but learning can and often does take place despite a less than optimal environment, for example; should, yes; must; not really. Item O isn't even a complete statement - if it isn't important enough for you to get it right, why should I invest MY time and effort? For Q, what is an educationist and why does creativity matter? When does creativity, especially on the part of a learner, ever more valuable or more appropriate than achievement or performance? Why change a course based on something so trivial as creativity? And how would you measure it anyway? With warm fuzzies? For R, why have a course and go looking for the 'correct' group? Wasn't the group identified before the resources were committed? Badly designed courses are not correct for any group - you have this entirely backwards for someone who should demonstrate expertise in this professional field. When I disagree with Item T, how can you tell from your statement which part I disagree with? Pacing yes, autonomy someones not. So, how do you know that and what is the data worth when you are unable to tell? Item V: read the literature and research on instructional feedback and how it affects learners and their success - and please stop perpetuating the myth that immediate feedback is appropriate in most instructional situations (teaching tennis or golf - fine; teaching most academic subjects - read the Kulhavy and Stock models). Y: formative assessment is primarily about assessing the effectiveness (and somewhat the efficiency) of the instruction by assessing what the learner knows and can do after completing the instruction; strategies and tactics are cognitive skills used as 'tools' to complete the 'job' so why would you focus on the 'tools' rather than the outcomes? I expect my repair person to have the correct tools and my concern is how well they completed the repairs to my house. If you are teaching cognitive skills to students, then you should assess the

'tools' because in that specific instance the tools are also the outcomes. Failure to assess outcomes (what students know and can do) is misalignment to the goal -didn't students take the course to acquire new skills and knowledge and shouldn't any professional educator respect that and behave accordingly?

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198 Jou vrae is lank en kompleks. Wil sterk voorstel jy vereenvoudig die stellings. Andersins weet jy nie eens of jou respondent reg gelees het en wat hul antwoord regtig bedui nie.

199 most of the "disagree" answers here should be taken to mean "not necessarily." E-learning can be used in situations where people just need to memorize material, even though this use is not appropriate in many situations. The survey does not seem to be free from bias, or to take the full range of situations into account.

200 Pedagogical requirements depend on the situation and learning objectives - whether these be mastery or 'higher' learning. Very impotant

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238 Once again, there are no musts in instructional design--it depends on resources, limitations, and goals.

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240 In the workplace, many learners take courses while eating lunch or if a meeting was cancelled. Consequently, topic length for self-paced study should be no more than 20 minutes.

241 See comments on section B.
My view is you have to spend a lot of time "up front" designing, and therefore having a flexible structure "on the fly" has to be sometimes sacrificed (of course, you can be flexibile within the structure you have built)

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Too many of the above items seem to be written with the assumption that there is only one appropriate way to design (e.g., ONLY constructivist), without permitting intended learning outcomes to have a sufficient influence on such matters! Too many 'absolutes' are assumed without considering alternatives that have been omitted!

The workload for both the lecturer and the students must not be excessive allowing for online social as well as eduction related interaction.

282

This is difficult to respond in this survey because of the use of the word "must." Each statement is
283 whether something MUST be present. I believe e-learning should be different for every context because the needs/goals will be different. It's hard to find some things that will ALWAYS be true.

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the design should allow for flexibility. Often times the nature of the content together with your
288 beliefs about learning influence your choice of instructional methods.

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Much of the items I agree strongly about yet the use of "must" is a distractor as both learners and
298 teachers may need time to achieve the must's - that's what learning and teaching are all about.

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The use of the word "must" disturbs me in all of these questions. Never is anything a "must".
301 "Should" would have been a better word.

all tasks must have aset deadline otherwise the learners motivation goes
302 also tutors should guide learners throught the discussion group so that they do not divert their attention away from the choosen topic.

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304

305 these questions very long, use jargon and are leading questions.

306 Many of the strategies or characteristics you list are means to ends, such as all the constructivist questions and some of the others. Constructivist approaches are appropriate for certain kinds of learning goals, but not for all. Your use of the word "must" made it very difficult to answer these questions because technically, if any exceptions occured to me I should not agree with it. However, I did agree with some questions even though I didn't agree with the word 'must'. Regarding 'j', I am not sure what you mean by principles of adult learning. Certainly the course should incorporate appropriate principles of learning and instruction, but traditional 'lists' of adult lerning principles are not sufficient and some of those priniples are not even valid.

307

308 Many of the above categories should be based on the type of course, the learning that is expected to take place, the audience learning the material, and their level of expertise with the instruction.

309 I am bothered again, by "must" -- it seems more appropriate to suggest "should" -- there are very few "must do" in education.

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312 none

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325 E-learners must be given time to feel comfort & trust in their community (social presence of learners critical)

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328 The pedagogical requirements as the same for normal classroom - but must be fitted towards the online interaction.

329 Of course, cultural diversity should be considered when designing instruction. However, it should be approached more with consideration to differing learning styles and challenges. I have found that some strategies are used that tend to lower academic standards for culturally diverse students, rather than scaffolding, mentoring, or coaching.... there appears to be a "coddling" attitude. In other words, there seems to be a definite inequality....it seems that it is sometimes made easier for the more culturally diverse students, especially when it comes to assessment standards.

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331 The pedagogy (particularly in a blended learning setting) should take account of online and face to face learning activities and not just be focused on the technological components (as this questionnaire has tended to be ;-))

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340 many of your questions are way too long if the respondent is to give simple categorical answers. The longer a question is the more likely the respondent will begin to disagree. Also, I didn't understand every question. E.g what does 'An appropriate relationship between transactional distance and learner autonomy must be maintained' mean?

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Q21

Please add any other Organisation related requirement that you have found through your own experience to be a pre-requisite before e-learning can commence. Please score this requirement accordingly.

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5 There are training needs that might fall more into the policy and awareness category, for which comprehensive training programs or development teams, or even high quality, are not required and may be over-kill.

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15 Return on Expectations (ROE) also plays an important part for the organisation.

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The questions I am responding to are poorly structured. Although I may agree with a portion of the statement, I most likely strongly disagree with another part. This is a poorly developed survey.

Very difficult to disagree here - but these tend only to be problems when something else goes wrong too (e.g., as asked in earlier sections).

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The e-learning course is best evaluated by learner and their assessments related to the course
106 objectives. Organizational performance (technologists, etc. need to be addressed as part of their yearly evaluations.)

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"Agree" = desired, but not required. M:improvements could include reduction in time delivering
108 training; cost savings; more efficient use of physical facilities. K: steps for course design might vary.

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f. Branding is not as important as the use of experts in the field to generate the content. An
112 additional content reviewer can be very effective as well.

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115

There are too many categorical statements that cannot be agreed with as a matter of principle -
116 they will depend on context of implementation

Item, h. Hardly ever happens in reality in my experience.
There are lots of kinds and sizes of businesses. Busineeds don't require gold plated cadilacs for every function. Sometimes a wheelbarrow or Cushman electric cart provides a better cost-benefit ratio. The answer to a lot of theses questions is "it depends." Also, LMS's are beginning to
117 assume a lot of the identified requirements, and they do not have to be addressed in the course itself.
Item m. I'm not sure I understand what you are asking? Is there anything remiss if the quality of the organization's training remains the same? Why should every course increase the quality, and when do you reach the point of diminishing returns?
Item u. I don't think this is true for all courses. Some courses have a very limited audience, and

they have to serve the audience they are intended for, even if that requires shutting out other audiences.

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122 again, it's too 'musty'

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136 BE READY TO IMPLEMENT IT, CONSIDER THE NEEDS OF AN ORGANIZATION.

137 The most critical factor in erms of organisational competency is not mentioned here, namely buy-in and ongoing support from management (see Shackelford, 2002)

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in point "t" I believe the spelling is "matrices"

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174 From a statistical viewpoint, or pedagogical one, it seems to me that you are looking at too many things within this survey.

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Where I disagree, the reason is that a better response than 'agree' would be 'not always' and you don't provide sufficient options for me to answer many items correctly. For F: branded instructinal content can certainly be worthless, it is not necessary unless the quality is sufficient and it specifically meets the need. For I: that info should be available for those who need it but not built into the content to harrass and patronize those of us with existing skills in the area. For S: how can an e-learning course allow for performance reviews? The org does that itself and rewards should be set for job performance improvement not for course completion - completing a bad or misaligned course is a poor use of resources; only job performance should be rewarded. If employees can learn better or more efficiently from another source, they should be rewarded for
176 efficiently improving job performance and the training department then gets demoted and maybe fired. Rewarding course completion is how incompetent training (non)professionals keep their jobs at the expense of the company's success. For V: if the company rewards performance and the courseware provides employees with the capability to improve their performance, they'll use it despite a culture that doesn't support self-study - because they want to be successful, to get raises, and to get promoted. The culture is only a factor when the courseware is worhtless and the training group incompetent - then they have to find ways to get people to complete the worthless courses so they reward course completion and work on the culture so employees get rewarded for doing self-study rather than getting rewarded for performance improvement or skill and knowledge acquisition.

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186 Questions do not seem to match the higher ed environment especially well. Again - disagree answers mean "not necessarily."

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If you required all this or even a quarter of it, no one would create e-learning.

Evaluation of online learning is a major challenge that I have tried to address in some of my work.

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247 Again, many 'overstatements' without considering alternative views.

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262 There needs to be a mechanism for employees to feedback/evaluate whether or not the up-the-line management really supports the on-line training or whether they just say so due to upper level support. (Do they really believe it or are they just giving the politically acceptable answer

and dismissing it behind their manager's back).

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Official recognition is key for e-learning success. I wouldn't be as strict about sticking to "correct"
269 design process. The process can vary depending upon the context, but it should involve systematic checks and allow for iteration and refineability. Leeway should be given for creativity.

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While accountability for quality control is imperative, adherence to a "cookie-cutter" model is
278 counter-productive. One size does not fit all.

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280

281 Ditto from last comment

support is necessary and good feedback is a must. Resources that are easily obtainable are a
282 must especially as some learners do not have access to libraries or university as they live and work in the third world countries.

283

284

285 Management needs to see good examples of elearning before they will invest the appropriate amount of resources

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290 none

291 Note: I'm not involved with elearning for my company's employees. I'm only involved with elearning for our customers. I have no experience developing elearning for our employees. I just thought I should mention this -- all I'm giving you are opinions.

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297 An e-learning course should have a mechanism by which students can provide feedback to the developers either on a particular screen or instructional strategy, or on the course overall. (Contact details of the business owner as mentioned in item A are tangentially related but not on target). Agree

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306 No difference here from normal interaction

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316 You've asked a HS teacher to complete this (I've worked with grades 6 - 12, and taken courses as a grad student) but this is really geared to commercial training, and that particular set of assumptions. In education we often do without the complex steps and personnel you assume necessary.

317

318 There's a lot to disagree with in this section. For example security measures do not ensure credibility. It's important that material has credibility but security doesn't create this. By answering this question there's no way to state that credibility is important.

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327 Support and respect from the top managment is crucial

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APPENDIX E

PHASE TWO: CROSS TABULATION TABLES OF THE E-READINESS MODEL'S CRITERIA WITH SIGNIFICANT RELATIONSHIPS

Cross Tabulation Frequency/Percent

7. [Q26] The educator must have the correct e-learning skills

		Strongly Agree	Agree	Disagree	Strongly Disagree	Row Totals
3. [Q5] How many years of experience...	Less than 5 years	74	25	6	0	105
		70.48%	23.81%	5.71%	0%	30.7%
	5 years and more but less than 10 years	90	48	5	0	143
		62.94%	33.57%	3.5%	0%	41.81%
	10 years and more but less than 15 years	38	23	1	0	62
		61.29%	37.1%	1.61%	0%	18.13%
	More than 15 years	17	13	1	1	32
		53.12%	40.62%	3.12%	3.12%	9.36%
	Column Total	219	109	13	1	342
	Column Percent	64.04%	31.87%	3.8%	0.29%	100%

Cross Tabulation Frequency/Percent

7. [Q26] The learner must be able to test the innovation in a safe working environment.

Strongly Agree	Agree	Disagree	Strongly Disagree	**Row Totals**
44	46	10	2	**102**

	43.14%	**45.1%**	**9.8%**	**1.96%**	**30.09%**
5 years and more but less than 10 years	50	65	25	3	**143**
	34.97%	**45.45%**	**17.48%**	**2.1%**	**42.18%**
10 years and more but less than 15 years	23	32	8	0	**63**
	36.51%	**50.79%**	**12.7%**	**0%**	**18.58%**
More than 15 years	12	7	8	4	**31**
	38.71%	**22.58%**	**25.81%**	**12.9%**	**9.14%**
Column Total	**129**	**150**	**51**	**9**	**339**
Column Percent	**38.05%**	**44.25%**	**15.04%**	**2.65%**	**100%**

Cross Tabulation Frequency/Percent

7. [Q26] The learner must be mentally ready for the course.

3. [Q5] How many years of ex ...	Strongly Agree	Agree	Disagree	Strongly Disagree	**Row Totals**
Less than 5 years	32	49	22	0	**103**
	31.07%	**47.57%**	**21.36%**	**0%**	**30.29%**
5 years and more but less than 10 years	35	75	32	1	**143**
	24.48%	**52.45%**	**22.38%**	**0.7%**	**42.06%**
10 years and more but less than 15 years	11	42	9	0	**62**
	17.74%	**67.74%**	**14.52%**	**0%**	**18.24%**
More than 15 years	2	22	7	1	**32**
	6.25%	**68.75%**	**21.88%**	**3.12%**	**9.41%**
Column Total	**80**	**188**	**70**	**2**	**340**
Column Percent	**23.53%**	**55.29%**	**20.59%**	**0.59%**	**100%**

Role or relationship as related to the Human resource Dimension

Cross Tabulation Frequency/Percent

7. [Q26] The learner must have the necessary cognitive skills.

4. [Q6] What is your current relationship.	Strongly Agree	Agree	Disagree	Strongly Disagree	**Row Totals**
I am a learner making use of e-learning to study.	26	18	3	0	**47**
	55.32%	**38.3%**	**6.38%**	**0%**	**13.58%**
I am an educator/facilitator using e-learning in training.	42	53	10	0	**105**
	40%	**50.48%**	**9.52%**	**0%**	**30.35%**
I am a manager involved with e-learning.	10	23	8	0	**41**
	24.39%	**56.1%**	**19.51%**	**0%**	**11.85%**
I am an Instructional Designer.	24	39	16	1	**80**
	30%	**48.75%**	**20%**	**1.25%**	**23.12%**
I am part of a support team of e-learning courses namely a media designer or instructional technologist or programmer or, network specialist, subject matter expert or quality specialist or sponsor.	4	13	7	1	**25**
	16%	**52%**	**28%**	**4%**	**7.23%**
Other	12	29	6	1	**48**
	25%	**60.42%**	**12.5%**	**2.08%**	**13.87%**
Column Total	**118**	**175**	**50**	**3**	**346**
Column Percent	**34.1%**	**50.58%**	**14.45%**	**0.87%**	**100%**

Cross Tabulation Frequency/Percent

7. [Q26] The learner must have the necessary subject matter pre-knowledge

4. [Q6] What is your current ...	Strongly Agree	Agree	Disagree	Strongly Disagree	**Row Totals**
I am a learner making use of e-learning to study.	19	21	6	0	**46**
	41.3%	**45.65%**	**13.04%**	**0%**	**13.33%**
I am an educator/facilitator using e-learning in training.	34	55	16	0	**105**
	32.38%	**52.38%**	**15.24%**	**0%**	**30.43%**
I am a manager involved with e-learning.	13	18	8	2	**41**
	31.71%	**43.9%**	**19.51%**	**4.88%**	**11.88%**
I am an Instructional Designer.	34	26	19	1	**80**
	42.5%	**32.5%**	**23.75%**	**1.25%**	**23.19%**
I am part of a support team of e-learning courses namely a media designer or instructional technologist or programmer or, network specialist, subject matter expert or quality specialist or sponsor.	2	16	7	0	**25**
	8%	**64%**	**28%**	**0%**	**7.25%**
Other	17	26	5	0	**48**
	35.42%	**54.17%**	**10.42%**	**0%**	**13.91%**
Column Total	**119**	**162**	**61**	**3**	**345**
Column Percent	**34.49%**	**46.96%**	**17.68%**	**0.87%**	**100%**

Cross Tabulation Frequency/Percent

7. [Q26] The learner must be mentally ready for the course.

4. [Q6] What is your current ...		Strongly Agree	Agree	Disagree	Strongly Disagree	**Row Totals**
	I am a learner making use of e-learning to study.	15	20	11	0	**46**
		32.61%	**43.48%**	**23.91%**	**0%**	**13.45%**
	I am an educator/facilitator using e-learning in training.	25	64	16	0	**105**
		23.81%	**60.95%**	**15.24%**	**0%**	**30.7%**
	I am a manager involved with e-learning.	3	29	8	0	**40**
		7.5%	**72.5%**	**20%**	**0%**	**11.7%**
	I am an Instructional Designer.	19	37	23	0	**79**
		24.05%	**46.84%**	**29.11%**	**0%**	**23.1%**
	I am part of a support team of e-learning courses namely a media designer or instructional technologist or programmer or, network specialist, subject matter expert or quality specialist or sponsor.	8	12	4	1	**25**
		32%	**48%**	**16%**	**4%**	7.31%
	Other	10	28	8	1	**47**
		21.28%	**59.57%**	**17.02%**	**2.13%**	**13.74%**
	Column Total	**80**	**190**	**70**	**2**	**342**
	Column Percent	**23.39%**	**55.56%**	**20.47%**	**0.58%**	**100%**

The relationship between context of involvement with e-learning and the Human Resource Dimension

Cross Tabulation Frequency/Percent

7. [Q26] The educator must have the necessary e-learning skills

5. [Q8] What is the context ...		Strongly Agree	Agree	Disagree	Strongly Disagree	**Row Totals**
	University, college or other institution for further education and training.	170	82	12	0	**264**
		64.39%	**31.06%**	**4.55%**	**0%**	**76.74%**
	School for children.	9	6	0	0	**15**
		60%	**40%**	**0%**	**0%**	**4.36%**
	The workplace (any business, industry etc.)	28	16	1	0	**45**
		62.22%	**35.56%**	**2.22%**	**0%**	**13.08%**
	Other	13	6	0	1	**20**
		65%	**30%**	**0%**	**5%**	**5.81%**
	Column Total	**220**	**110**	**13**	**1**	**344**
	Column Percent	**63.95%**	**31.98%**	**3.78%**	**0.29%**	**100%**

Cross Tabulation Frequency/Percent

7. [Q26] A plan – incorporating input from learners for marketing etc.

5. [Q8] What is the context ...		Strongly Agree	Agree	Disagree	Strongly Disagree	**Row Totals**
	University, college or other institution for further education and training.	90	141	26	3	**260**
		34.62%	**54.23%**	**10%**	**1.15%**	**76.7%**
	School for children.	5	7	3	0	**15**
		33.33%	**46.67%**	**20%**	**0%**	**4.42%**

The workplace (any business, industry etc.)	25	15	4	0	**44**
	56.82%	**34.09%**	**9.09%**	**0%**	**12.98%**
Other	7	10	1	2	**20**
	35%	**50%**	**5%**	**10%**	**5.9%**
Column Total	**127**	**173**	**34**	**5**	**339**
Column Percent	**37.46%**	**51.03%**	**10.03%**	**1.47%**	**100%**

THE TECHNOLOGY DIMENSION

Significant relationships between years of experience and the Technology Dimension

Cross Tabulation Frequency/Percent

9. [Q14] The e-learning material should appeal to both hemispheres.

		Strongly Agree	Agree	Disagree	Strongly Disagree	**Row Totals**
3. [Q5] How many years of ex ...	Less than 5 years	36	55	8	0	**99**
		36.36%	**55.56%**	**8.08%**	**0%**	**29.91%**
	5 years and more but less than 10 years	45	78	16	0	**139**
		32.37%	**56.12%**	**11.51%**	**0%**	**41.99%**
	10 years and more but less than 15 years	18	36	9	0	**63**
		28.57%	**57.14%**	**14.29%**	**0%**	**19.03%**
	More than 15 years	4	16	6	4	**30**
		13.33%	**53.33%**	**20%**	**13.33%**	**9.06%**
	Column Total	**103**	**185**	**39**	4	**331**
	Column Percent	**31.12%**	**55.89%**	**11.78%**	**1.21%**	**100%**

Cross Tabulation Frequency/Percent 9. [Q14] The e-learning material must add aesthetic value

3. [Q5] How many years of ex ...		Strongly Agree	Agree	Disagree	Strongly Disagree	**Row Totals**
	Less than 5 years	36	55	8	0	**99**
		36.36%	**55.56%**	**8.08%**	**0%**	**29.91%**
	5 years and more but less than 10 years	45	78	16	0	**139**
		32.37%	**56.12%**	**11.51%**	**0%**	**41.99%**
	10 years and more but less than 15 years	18	36	9	0	**63**
		28.57%	**57.14%**	**14.29%**	**0%**	**19.03%**
	More than 15 years	4	16	6	4	**30**
		13.33%	**53.33%**	**20%**	**13.33%**	**9.06%**
	Column Total	**103**	**185**	**39**	**4**	**331**
	Column Percent	**31.12%**	**55.89%**	**11.78%**	**1.21%**	**100%**

Cross Tabulation Frequency/Percent 9. [Q14] The material must have a printable version

	Strongly Agree	Agree	Disagree	Strongly Disagree	**Row Totals**
Less than 5 years	41	43	13	1	**98**
	41.84%	**43.88%**	**13.27%**	**1.02%**	**29.61%**
5 years and more but less than 10 years	55	74	9	2	**140**
	39.29%	**52.86%**	**6.43%**	**1.43%**	**42.3%**

10 years and more but less than 15 years	24	33	6	0	**63**
	38.1%	**52.38%**	**9.52%**	**0%**	**19.03%**
More than 15 years	8	13	5	4	**30**
	26.67%	**43.33%**	**16.67%**	**13.33%**	**9.06%**
Column Total	**128**	**163**	**33**	**7**	**331**
Column Percent	**38.67%**	**49.24%**	**9.97%**	**2.11%**	**100%**

Cross Tabulation Frequency/Percent

9. [Q14] The e-learning course must make use of scalable technology

		Strongly Agree	Agree	Disagree	Strongly Disagree	**Row Totals**
3. [Q5] How many years of ex ...	Less than 5 years	20	66	10	0	**96**
		20.83%	**68.75%**	**10.42%**	**0%**	**29.54%**
	5 years and more but less than 10 years	32	77	27	1	**137**
		23.36%	**56.2%**	**19.71%**	**0.73%**	**42.15%**
	10 years and more but less than 15 years	17	28	16	1	**62**
		27.42%	**45.16%**	**25.81%**	**1.61%**	**19.08%**
	More than 15 years	5	13	9	3	**30**
		16.67%	**43.33%**	**30%**	**10%**	**9.23%**
	Column Total	**74**	**184**	**62**	**5**	**325**
	Column Percent	**22.77%**	**56.62%**	**19.08%**	**1.54%**	**100%**

Cross Tabulation Frequency/Percent

9. [Q14] Available anywhere, anytime

		Strongly Agree	Agree	Disagree	Strongly Disagree	**Row Totals**
	Less than 5 years	41	45	11	1	**98**
		41.84%	**45.92%**	**11.22%**	**1.02%**	**29.88%**
3. [Q5] How many years of ex ...	5 years and more but less than 10 years	40	61	33	4	**138**
		28.99%	**44.2%**	**23.91%**	**2.9%**	**42.07%**
	10 years and more but less than 15 years	18	27	18	0	**63**
		28.57%	**42.86%**	**28.57%**	**0%**	**19.21%**
	More than 15 years	6	10	12	1	**29**
		20.69%	**34.48%**	**41.38%**	**3.45%**	**8.84%**
	Column Total	**105**	**143**	**74**	**6**	**328**
	Column Percent	**32.01%**	**43.6%**	**22.56%**	**1.83%**	**100%**

Cross Tabulation
Frequency/Percent

9. [Q14] The e-learning course must use centralized tracking and administration ...

		Strongly Agree	Agree	Disagree	Strongly Disagree	**Row Totals**
3. [Q5] How many years of ex ...	Less than 5 years	42	49	8	0	**99**
		42.42%	**49.49%**	**8.08%**	**0%**	**29.82%**
	5 years and more but less than 10 years	42	74	22	2	**140**
		30%	**52.86%**	**15.71%**	**1.43%**	**42.17%**
	10 years and more but less than 15 years	18	36	9	0	**63**
		28.57%	**57.14%**	**14.29%**	**0%**	**18.98%**
	More than 15 years	9	11	9	1	**30**
		30%	**36.67%**	**30%**	**3.33%**	**9.04%**
	Column Total	**111**	**170**	**48**	**3**	**332**
	Column Percent	**33.43%**	**51.2%**	**14.46%**	**0.9%**	**100%**

The relationships between the role of respondents towards e-learning and the Technology Dimension

Cross Tabulation Frequency/Percent	9. [Q14] There must be a helpline for technical support					
		Strongly Agree	Agree	Disagree	Strongly Disagree	**Row Totals**
4. [Q6] What is your current ...	I am a learner making use of e-learning to study.	34	9	1	1	**45**
		75.56%	**20%**	**2.22%**	**2.22%**	**13.64%**
	I am an educator/facilitator using e-learning in training.	57	39	7	0	**103**
		55.34%	**37.86%**	**6.8%**	**0%**	**31.21%**
	I am a manager involved with e-learning.	19	16	2	0	**37**
		51.35%	**43.24%**	**5.41%**	**0%**	**11.21%**
	I am an Instructional Designer.	42	25	8	0	**75**
		56%	**33.33%**	**10.67%**	**0%**	**22.73%**
	I am part of a support team of e-learning courses namely a media designer or instructional technologist or programmer or, network specialist, subject matter expert or quality specialist or sponsor.	11	11	0	1	**23**
		47.83%	**47.83%**	**0%**	**4.35%**	**6.97%**
	Other	32	11	4	0	**47**
		68.09%	**23.4%**	**8.51%**	**0%**	**14.24%**
	Column Total	**195**	**111**	**22**	**2**	**330**
	Column Percent	**59.09%**	**33.64%**	**6.67%**	**0.61%**	**100%**

The relationship between the context of involvement with e-learning and the Technology Dimension

Cross Tabulation Frequency/Percent

9. [Q14] The appearance and u ...

5. [Q8] What is the context ...		Strongly Agree	Agree	Disagree	Strongly Disagree	**Row Totals**
	University, college or other institution for further education and training.	147	101	7	2	**257**
		57.2%	**39.3%**	**2.72%**	**0.78%**	**76.95%**
	School for children.	6	6	3	0	**15**
		40%	**40%**	**20%**	**0%**	**4.49%**
	The workplace (any business, industry etc.)	26	12	**4**	0	**42**
		61.9%	**28.57%**	**9.52%**	**0%**	**12.57%**
	Other	9	11	0	0	**20**
		45%	**55%**	**0%**	**0%**	**5.99%**
	Column Total	**188**	**130**	**14**	**2**	**334**
	Column Percent	**56.29%**	**38.92%**	**4.19%**	**0.6%**	**100%**

Cross Tabulation Frequency/Percent

9. [Q14] The e-learning course must be technically simple to use

		Strongly Agree	Agree	Disagree	Strongly Disagree	**Row Totals**
5. [Q8] What is the context ...	University, college or other institution for further education and training.	101	119	34	0	**254**
		39.76%	**46.85%**	**13.39%**	**0%**	**76.97%**
	School for children.	4	8	3	0	**15**
		26.67%	**53.33%**	**20%**	**0%**	**4.55%**
	The workplace (any business, industry etc.)	16	19	7	0	**42**
		38.1%	**45.24%**	**16.67%**	**0%**	**12.73%**
	Other	6	7	5	1	**19**
		31.58%	**36.84%**	**26.32%**	**5.26%**	**5.76%**
	Column Total	**127**	**153**	**49**	**1**	**330**
	Column Percent	**38.48%**	**46.36%**	**14.85%**	**0.3%**	**100%**

THE PEDAGOGY DIMENSION

The relationship between the years of experience and the Pedagogical Dimension

Cross Tabulation
Frequency/Percent

11. [Q17] The e-learning design must support the Constructivist epistemology

		Strongly Agree	Agree	Disagree	Strongly Disagree	**Row Totals**
3. [Q5] How many years of ex ...	Less than 5 years	36	44	9	1	**90**
		40%	**48.89%**	**10%**	**1.11%**	**28.94%**
	5 years and more but less than 10 years	53	57	22	1	**133**
		39.85%	**42.86%**	**16.54%**	**0.75%**	**42.77%**
	10 years and more but less than 15 years	21	27	10	2	**60**
		35%	**45%**	**16.67%**	**3.33%**	**19.29%**
	More than 15 years	6	10	8	4	**28**
		21.43%	**35.71%**	**28.57%**	**14.29%**	**9%**
	Column Total	**116**	**138**	**49**	**8**	**311**
	Column Percent	**37.3%**	**44.37%**	**15.76%**	**2.57%**	**100%**

Cross Tabulation
Frequency/Percent

11. [Q17] E-learning course must be humanised.

		Strongly Agree	Agree	Disagree	Strongly Disagree	**Row Totals**
3. [Q5] How many years of ex ...	Less than 5 years	47	34	8	0	**89**
		52.81%	**38.2%**	**8.99%**	**0%**	**28.62%**
	5 years and more but less than 10 years	62	50	20	1	**133**
		46.62%	**37.59%**	**15.04%**	**0.75%**	**42.77%**
	10 years and more but less than 15 years	24	26	8	2	**60**
		40%	**43.33%**	**13.33%**	**3.33%**	**19.29%**
	More than 15 years	8	8	12	1	**29**
		27.59%	**27.59%**	**41.38%**	**3.45%**	**9.32%**
	Column Total	**141**	**118**	**48**	**4**	**311**
	Column Percent	**45.34%**	**37.94%**	**15.43%**	**1.29%**	**100%**

Cross Tabulation
Frequency/Percent

11. [Q17] The goal orientation must be unfocused.

		Strongly Agree	Agree	Disagree	Strongly Disagree	**Row Totals**
3. [Q5] How many years of ex ...	Less than 5 years	23	36	27	2	**88**
		26.14%	**40.91%**	**30.68%**	**2.27%**	**28.48%**
	5 years and more but less than 10 years	20	53	53	6	**132**
		15.15%	**40.15%**	**40.15%**	**4.55%**	**42.72%**
	10 years and more but less than 15 years	8	16	30	6	**60**
		13.33%	**26.67%**	**50%**	**10%**	**19.42%**
	More than 15 years	1	7	10	11	**29**
		3.45%	**24.14%**	**34.48%**	**37.93%**	**9.39%**
	Column Total	**52**	**112**	**120**	**25**	**309**
	Column Percent	**16.83%**	**36.25%**	**38.83%**	**8.09%**	**100%**

Cross Tabulation Frequency/Percent

11. [Q17] The e-learning course must provide comprehensive resource.

		Strongly Agree	Agree	Disagree	Strongly Disagree	**Row Totals**
3. [Q5] How many years of ex ...	Less than 5 years	37	43	9	0	**89**
		41.57%	**48.31%**	**10.11%**	**0%**	**28.8%**
	5 years and more but less than 10 years	25	84	23	1	**133**
		18.8%	**63.16%**	**17.29%**	**0.75%**	**43.04%**
	10 years and more but less than 15 years	9	32	15	3	**59**
		15.25%	**54.24%**	**25.42%**	**5.08%**	**19.09%**
	More than 15 years	4	10	10	4	**28**
		14.29%	**35.71%**	**35.71%**	**14.29%**	**9.06%**
	Column Total	**75**	**169**	**57**	**8**	**309**
	Column Percent	**24.27%**	**54.69%**	**18.45%**	**2.59%**	**100%**

Cross Tabulation Frequency/Percent

11. [Q17] Face to face contact sessions must be arranged.

		Strongly Agree	Agree	Disagree	Strongly Disagree	**Row Totals**
	Less than 5 years	21	33	32	3	**89**
		23.6%	**37.08%**	**35.96%**	**3.37%**	**28.62%**
3. [Q5] How many years of ex ...	5 years and more but less than 10 years	17	40	62	14	**133**
		12.78%	**30.08%**	**46.62%**	**10.53%**	**42.77%**
	10 years and more but less than 15 years	17	15	25	3	**60**
		28.33%	**25%**	**41.67%**	**5%**	**19.29%**
	More than 15 years	2	8	13	6	**29**
		6.9%	**27.59%**	**44.83%**	**20.69%**	**9.32%**
	Column Total	**57**	**96**	**132**	**26**	**311**
	Column Percent	**18.33%**	**30.87%**	**42.44%**	**8.36%**	**100%**

Cross Tabulation Frequency/Percent	11. [Q17] The e-learning course must be modifiable					
		Strongly Agree	Agree	Disagree	Strongly Disagree	**Row Totals**
3. [Q5] How many years of ex ...	Less than 5 years	52	33	**4**	0	**89**
		58.43%	**37.08%**	**4.49%**	**0%**	**28.71%**
	5 years and more but less than 10 years	50	71	10	1	**132**
		37.88%	**53.79%**	**7.58%**	**0.76%**	**42.58%**
	10 years and more but less than 15 years	**24**	32	3	1	**60**
		40%	**53.33%**	**5%**	**1.67%**	**19.35%**
	More than 15 years	11	12	5	1	**29**
		37.93%	**41.38%**	**17.24%**	**3.45%**	**9.35%**
	Column Total	**137**	**148**	**22**	**3**	**310**
	Column Percent	**44.19%**	**47.74%**	**7.1%**	**0.97%**	**100%**

Cross Tabulation
Frequency/Percent

11. [Q17] The e-learning course should require less adjustment.

		Strongly Agree	Agree	Disagree	Strongly Disagree	**Row Totals**
3. [Q5] How many years of ex ...	Less than 5 years	24	38	25	2	**89**
		26.97%	**42.7%**	**28.09%**	**2.25%**	**29.18%**
	5 years and more but less than 10 years	16	53	58	5	**132**
		12.12%	**40.15%**	**43.94%**	**3.79%**	**43.28%**
	10 years and more but less than 15 years	7	19	29	2	**57**
		12.28%	**33.33%**	**50.88%**	**3.51%**	**18.69%**
	More than 15 years	3	13	9	2	**27**
		11.11%	**48.15%**	**33.33%**	**7.41%**	**8.85%**
	Column Total	**50**	**123**	**121**	**11**	**305**
	Column Percent	**16.39%**	**40.33%**	**39.67%**	**3.61%**	**100%**

Cross Tabulation Frequency/Percent

11. [Q17] An appropriate relationship between transactional distance and learner autonomy.

		Strongly Agree	Agree	Disagree	Strongly Disagree	**Row Totals**
3. [Q5] How many years of ex ...	Less than 5 years	28	55	4	0	**87**
		32.18%	**63.22%**	**4.6%**	**0%**	**28.81%**
	5 years and more but less than 10 years	37	85	8	0	**130**
		28.46%	**65.38%**	**6.15%**	**0%**	**43.05%**
	10 years and more but less than 15 years	10	47	1	2	**60**
		16.67%	**78.33%**	**1.67%**	**3.33%**	**19.87%**
	More than 15 years	7	15	3	0	**25**
		28%	**60%**	**12%**	**0%**	**8.28%**
	Column Total	**82**	**202**	**16**	**2**	**302**
	Column Percent	**27.15%**	**66.89%**	**5.3%**	**0.66%**	**100%**

Cross Tabulation Frequency/Percent

11. [Q17] There must be quick .feedback times

		Strongly Agree	Agree	Disagree	Strongly Disagree	**Row Totals**
3. [Q5] How many years of ex ...	Less than 5 years	60	25	4	0	**89**
		67.42%	**28.09%**	**4.49%**	**0%**	**28.62%**
	5 years and more but less than 10 years	67	59	7	0	**133**
		50.38%	**44.36%**	**5.26%**	**0%**	**42.77%**
	10 years and more but less than 15 years	23	31	5	1	**60**
		38.33%	**51.67%**	**8.33%**	**1.67%**	**19.29%**
	More than 15 years	14	13	2	0	**29**
		48.28%	**44.83%**	**6.9%**	**0%**	**9.32%**
	Column Total	**164**	**128**	**18**	**1**	**311**
	Column Percent	**52.73%**	**41.16%**	**5.79%**	**0.32%**	**100%**

Cross Tabulation Frequency/Percent

11. [Q17] The e-learning course must make use of formative assessment.

		Strongly Agree	Agree	Disagree	Strongly Disagree	**Row Totals**
3. [Q5] How many years of ex ...	Less than 5 years	33	50	4	0	**87**
		37.93%	**57.47%**	**4.6%**	**0%**	**28.34%**
	5 years and more but less than 10 years	49	62	21	1	**133**
		36.84%	**46.62%**	**15.79%**	**0.75%**	**43.32%**
	10 years and more but less than 15 years	14	32	12	1	**59**
		23.73%	**54.24%**	**20.34%**	**1.69%**	**19.22%**
	More than 15 years	13	9	6	0	**28**
		46.43%	**32.14%**	**21.43%**	**0%**	**9.12%**
	Column Total	**109**	**153**	**43**	**2**	**307**
	Column Percent	**35.5%**	**49.84%**	**14.01%**	**0.65%**	**100%**

Cross Tabulation Frequency/Percent

11. [Q17] There must be match between size of group and educational strategy.

		Strongly Agree	Agree	Disagree	Strongly Disagree	**Row Totals**
3. [Q5] How many years of ex ...	Less than 5 years	35	46	7	0	**88**
		39.77%	**52.27%**	**7.95%**	**0%**	**28.57%**
	5 years and more but less than 10 years	50	75	6	1	**132**
		37.88%	**56.82%**	**4.55%**	**0.76%**	**42.86%**
	10 years and more but less than 15 years	21	35	2	1	**59**
		35.59%	**59.32%**	**3.39%**	**1.69%**	**19.16%**
	More than 15 years	12	9	7	1	**29**
		41.38%	**31.03%**	**24.14%**	**3.45%**	**9.42%**
	Column Total	**118**	**165**	**22**	**3**	**308**
	Column Percent	**38.31%**	**53.57%**	**7.14%**	**0.97%**	**100%**

The relationship between the role towards e-learning and the Pedagogy Dimension

Cross Tabulation Frequency/Percent

11. [Q17] The e-learning design must support the Constructivist epistemology.

4. [Q6] What is your current ...		Strongly Agree	Agree	Disagree	Strongly Disagree	**Row Totals**
	I am a learner making use of e-learning to study.	16	22	2	0	**40**
		40%	**55%**	**5%**	**0%**	**12.78%**
	I am an educator/facilitator using e-learning in training.	41	40	14	2	**97**
		42.27%	**41.24%**	**14.43%**	**2.06%**	**30.99%**
	I am a manager involved with e-learning.	11	16	7	2	**36**
		30.56%	**44.44%**	**19.44%**	**5.56%**	**11.5%**
	I am an Instructional Designer.	30	29	10	4	**73**
		41.1%	**39.73%**	**13.7%**	**5.48%**	**23.32%**
	I am part of a support team of e-learning courses namely a media designer or instructional technologist or programmer or, network specialist, subject matter expert or quality specialist or sponsor.	3	16	4	0	**23**
		13.04%	**69.57%**	**17.39%**	**0%**	**7.35%**
	Other	16	16	12	0	**44**

	36.36%	**36.36%**	**27.27%**	**0%**	**14.06%**
Column Total	**117**	**139**	**49**	**8**	**313**
Column Percent	**37.38%**	**44.41%**	**15.65%**	**2.56%**	**100%**

Cross Tabulation Frequency/Percent

11. [Q17] The e-learning course must use an appropriate interaction typology.

4. [Q6] What is your current ...	Strongly Agree	Agree	Disagree	Strongly Disagree	**Row Totals**
I am a learner making use of e-learning to study.	22	15	3	0	**40**
	55%	**37.5%**	**7.5%**	**0%**	**12.74%**
I am an educator/facilitator using e-learning in training.	48	43	7	0	**98**
	48.98%	**43.88%**	**7.14%**	**0%**	**31.21%**
I am a manager involved with e-learning.	8	26	2	0	**36**
	22.22%	**72.22%**	**5.56%**	**0%**	**11.46%**
I am an Instructional Designer.	30	27	15	1	**73**
	41.1%	**36.99%**	**20.55%**	**1.37%**	**23.25%**
I am part of a support team of e-learning courses namely a media designer or instructional technologist or programmer or, network specialist, subject matter expert or quality specialist or sponsor.	4	14	5	0	**23**
	17.39%	**60.87%**	**21.74%**	**0%**	**7.32%**

expert or quality specialist or sponsor.					
Other	20	12	10	1	**43**
	46.51%	**27.91%**	**23.26%**	**2.33%**	**13.74%**
Column Total	**143**	**118**	**48**	**4**	**313**
Column Percent	**45.69%**	**37.7%**	**15.34%**	**1.28%**	**100%**

Cross Tabulation Frequency/Percent

11. [Q17] The goal orientation must be unfocused to support inductive learning.

4. [Q6] What is your current ...	Strongly Agree	Agree	Disagree	Strongly Disagree	**Row Totals**
I am a learner making use of e-learning to study.	9	19	11	1	**40**
	22.5%	**47.5%**	**27.5%**	**2.5%**	**12.86%**
I am an educator/facilitator using e-learning in training.	23	36	33	4	**96**
	23.96%	**37.5%**	**34.38%**	**4.17%**	**30.87%**
I am a manager involved with e-learning.	4	8	21	3	**36**
	11.11%	**22.22%**	**58.33%**	**8.33%**	**11.58%**
I am an Instructional Designer.	9	27	32	4	**72**
	12.5%	**37.5%**	**44.44%**	**5.56%**	**23.15%**
I am part of a support team of e-	0	6	13	4	**23**

learning courses namely a media designer or instructional technologist or programmer or, network specialist, subject matter expert or quality specialist or sponsor.	**0%**	**26.09%**	**56.52%**	**17.39%**	**7.4%**
Other	8	16	11	9	**44**
	18.18%	**36.36%**	**25%**	**20.45%**	**14.15%**
Column Total	**53**	**112**	**121**	**25**	**311**
Column Percent	**17.04%**	**36.01%**	**38.91%**	**8.04%**	**100%**

Cross Tabulation Frequency/Percent

11. [Q17] The learning material must be authentic.

4. [Q6] What is your current ...		Strongly Agree	Agree	Disagree	Strongly Disagree	**Row Totals**
	I am a learner making use of e-learning to study.	14	22	4	0	**40**
		35%	**55%**	**10%**	**0%**	**12.86%**
	I am an educator/facilitator using e-learning in training.	28	42	27	0	**97**
		28.87%	**43.3%**	**27.84%**	**0%**	**31.19%**
	I am a manager involved with e-learning.	4	19	12	1	**36**
		11.11%	**52.78%**	**33.33%**	**2.78%**	**11.58%**
	I am an Instructional Designer.	19	27	23	2	**71**

	26.76%	**38.03%**	**32.39%**	**2.82%**	**22.83%**
I am part of a support team of e-learning courses namely a media designer or instructional technologist or programmer or, network specialist, subject matter expert or quality specialist or sponsor.	3	12	7	1	**23**
	13.04%	**52.17%**	**30.43%**	**4.35%**	**7.4%**
Other	13	23	4	4	**44**
	29.55%	**52.27%**	**9.09%**	**9.09%**	**14.15%**
Column Total	81	145	77	8	311
Column Percent	**26.05%**	**46.62%**	**24.76%**	**2.57%**	**100%**

Cross Tabulation Frequency/Percent

11. [Q17] The e-learning course must allow for learner autonomy and self pacing.

4. [Q6] What is your current ...		Strongly Agree	Agree	Disagree	Strongly Disagree	**Row Totals**
	I am a learner making use of e-learning to study.	18	15	6	1	**40**
		45%	**37.5%**	**15%**	**2.5%**	**12.86%**
	I am an educator/facilitator using e-learning in training.	37	41	19	0	**97**
		38.14%	**42.27%**	**19.59%**	**0%**	**31.19%**
	I am a manager involved with e-	9	14	12	1	**36**

learning.	**25%**	**38.89%**	**33.33%**	**2.78%**	**11.58%**
I am an Instructional Designer.	22	46	3	0	**71**
	30.99%	**64.79%**	**4.23%**	**0%**	**22.83%**
I am part of a support team of e-learning courses namely a media designer or instructional technologist or programmer or, network specialist, subject matter expert or quality specialist or sponsor.	8	11	4	0	**23**
	34.78%	**47.83%**	**17.39%**	**0%**	**7.4%**
Other	11	22	11	0	**44**
	25%	**50%**	**25%**	**0%**	**14.15%**
Column Total	**105**	**149**	**55**	**2**	**311**
Column Percent	**33.76%**	**47.91%**	**17.68%**	**0.64%**	**100%**

Cross Tabulation Frequency/Percent

11. [Q17] There must be quick feedback time.

4. [Q6] What is your current ...		Strongly Agree	Agree	Disagree	Strongly Disagree	**Row Totals**
	I am a learner making use of e-learning to study.	30	9	1	0	**40**
		75%	**22.5%**	**2.5%**	**0%**	**12.78%**
	I am an educator/facilitator using e-learning in training.	51	42	5	0	**98**
		52.04%	**42.86%**	**5.1%**	**0%**	**31.31%**

I am a manager involved with e-learning.	11	23	2	0	**36**
	30.56%	**63.89%**	**5.56%**	**0%**	**11.5%**
I am an Instructional Designer.	40	28	4	0	**72**
	55.56%	**38.89%**	**5.56%**	**0%**	**23%**
I am part of a support team of e-learning courses namely a media designer or instructional technologist or programmer or, network specialist, subject matter expert or quality specialist or sponsor.	11	9	3	0	**23**
	47.83%	**39.13%**	**13.04%**	**0%**	**7.35%**
Other	22	17	4	1	**44**
	50%	**38.64%**	**9.09%**	**2.27%**	**14.06%**
Column Total	**165**	**128**	**19**	**1**	**313**
Column Percent	**52.72%**	**40.89%**	**6.07%**	**0.32%**	**100%**

Significant relationships between the context of involvement with e-learning and the Pedagogy Dimension

Cross Tabulation Frequency/Percent

11. [Q17] E-learning course must humanise the class

		Strongly Agree	Agree	Disagree	Strongly Disagree	**Row Totals**
5. [Q8] What is the context ...	University, college or other institution for further education and training.	116	99	25	2	**242**
		47.93%	**40.91%**	**10.33%**	**0.83%**	**77.32%**
	School for children.	8	4	3	0	**15**
		53.33%	**26.67%**	**20%**	**0%**	**4.79%**
	The workplace (any business, industry etc.)	10	10	15	1	**36**
		27.78%	**27.78%**	**41.67%**	**2.78%**	**11.5%**
	Other	9	5	5	1	**20**
		45%	**25%**	**25%**	**5%**	**6.39%**
	Column Total	**143**	**118**	**48**	**4**	**313**
	Column Percent	**45.69%**	**37.7%**	**15.34%**	**1.28%**	**100%**

11. [Q17] The e-learning course must use instructional processes for knowledge construction.

	Strongly Agree	Agree	Disagree	Strongly Disagree	**Row Totals**
University, college or other institution for further	93	117	30	0	**240**

education and training.	**38.75%**	**48.75%**	**12.5%**	**0%**	**77.42%**
	5	7	3	0	**15**
School for children.					
	33.33%	**46.67%**	**20%**	**0%**	**4.84%**
	12	20	3	0	**35**
The workplace (any business, industry etc.)					
	34.29%	**57.14%**	**8.57%**	**0%**	**11.29%**
	8	7	4	1	**20**
Other					
	40%	**35%**	**20%**	**5%**	**6.45%**
Column Total	**118**	**151**	**40**	**1**	**310**
Column Percent	**38.06%**	**48.71%**	**12.9%**	**0.32%**	**100%**

Cross Tabulation Frequency/Percent 11. [Q17] The e-learning course must consider the diversity amongst learners.

5. [Q8] What is the context ...		Strongly Agree	Agree	Disagree	Strongly Disagree	**Row Totals**
	University, college or other institution for further education and training.	124	104	11	3	**242**
		51.24%	**42.98%**	**4.55%**	**1.24%**	**77.32%**
	School for children.	6	9	0	0	**15**
		40%	**60%**	**0%**	**0%**	**4.79%**
	The workplace (any	11	24	0	1	**36**

business, industry etc.)	**30.56%**	**66.67%**	**0%**	**2.78%**	**11.5%**
	11	6	3	0	**20**
Other	**55%**	**30%**	**15%**	**0%**	**6.39%**
Column Total	**152**	**143**	**14**	**4**	**313**
Column Percent	**48.56%**	**45.69%**	**4.47%**	**1.28%**	**100%**

Cross Tabulation Frequency/Percent

11. [Q17] The E-learning course must comply with principles of adult learning.

		Strongly Agree	Agree	Disagree	Strongly Disagree	**Row Totals**
5. [Q8] What is the context ...	University, college or other institution for further education and training.	104	106	28	3	**241**
		43.15%	**43.98%**	**11.62%**	**1.24%**	**77.74%**
	School for children.	5	4	4	2	**15**
		33.33%	**26.67%**	**26.67%**	**13.33%**	**4.84%**
	The workplace (any business, industry etc.)	15	18	2	1	**36**
		41.67%	**50%**	**5.56%**	**2.78%**	**11.61%**
	Other	5	9	2	2	**18**
		27.78%	**50%**	**11.11%**	**11.11%**	**5.81%**
	Column Total	**129**	**137**	**36**	**8**	**310**
	Column Percent	**41.61%**	**44.19%**	**11.61%**	**2.58%**	**100%**

Cross Tabulation Frequency/Percent

11. [Q17] The time spent online must be supportive of the learning process.

5. [Q8] What is the context ...		Strongly Agree	Agree	Disagree	Strongly Disagree	Row Totals
	University, college or other institution for further education and training.	91	142	5	0	**238**
		38.24%	**59.66%**	**2.1%**	**0%**	**77.27%**
	School for children.	6	8	0	1	**15**
		40%	**53.33%**	**0%**	**6.67%**	**4.87%**
	The workplace (any business, industry etc.)	12	22	2	0	**36**
		33.33%	**61.11%**	**5.56%**	**0%**	**11.69%**
	Other	8	11	0	0	**19**
		42.11%	**57.89%**	**0%**	**0%**	**6.17%**
	Column Total	**117**	**183**	**7**	**1**	**308**
	Column Percent	**37.99%**	**59.42%**	**2.27%**	**0.32%**	**100%**

Cross Tabulation Frequency/Percent

11. [Q17] The e-learning course must be modifiable.

5. [Q8] What is the context ...		Strongly Agree	Agree	Disagree	Strongly Disagree	Row Totals
	University, college or other institution for further education and training.	108	118	14	1	**241**
		44.81%	**48.96%**	**5.81%**	**0.41%**	**77.24%**
	School for children.	5	8	2	0	**15**
		33.33%	**53.33%**	**13.33%**	**0%**	**4.81%**
	The workplace (any	15	17	4	0	**36**

	business, industry etc.)	**41.67%**	**47.22%**	**11.11%**	**0%**	**11.54%**
	Other	11	5	2	2	**20**
		55%	**25%**	**10%**	**10%**	**6.41%**
	Column Total	**139**	**148**	**22**	**3**	**312**
	Column Percent	**44.55%**	**47.44%**	**7.05%**	**0.96%**	**100%**

Cross Tabulation Frequency/Percent

11. [Q17] An appropriate relationship between distance and learner autonomy.

		Strongly Agree	Agree	Disagree	Strongly Disagree	**Row Totals**
	University, college or other institution for further education and training.	64	157	13	1	**235**
		27.23%	**66.81%**	**5.53%**	**0.43%**	**77.3%**
5. [Q8] What is the context ...	School for children.	4	11	0	0	**15**
		26.67%	**73.33%**	**0%**	**0%**	**4.93%**
	The workplace (any business, industry etc.)	6	28	1	0	**35**
		17.14%	**80%**	**2.86%**	**0%**	**11.51%**
	Other	9	6	3	1	**19**
		47.37%	**31.58%**	**15.79%**	**5.26%**	**6.25%**
	Column Total	**83**	**202**	**17**	**2**	**304**
	Column Percent	**27.3%**	**66.45%**	**5.59%**	**0.66%**	**100%**

Cross Tabulation Frequency/Percent

11. [Q17] The e-learning cours ...

		Strongly Agree	Agree	Disagree	Strongly Disagree	**Row Totals**
5. [Q8] What is the context ...	University, college or other institution for further education and training.	89	125	26	0	**240**
		37.08%	**52.08%**	**10.83%**	**0%**	**77.92%**
	School for children.	3	5	6	1	**15**
		20%	**33.33%**	**40%**	**6.67%**	**4.87%**
	The workplace (any business, industry etc.)	10	16	8	0	**34**
		29.41%	**47.06%**	**23.53%**	**0%**	**11.04%**
	Other	8	7	3	1	**19**
		42.11%	**36.84%**	**15.79%**	**5.26%**	**6.17%**
	Column Total	**110**	**153**	**43**	**2**	**308**
	Column Percent	**35.71%**	**49.68%**	**13.96%**	**0.65%**	**100%**

Statistical significant relationship between years of experience and the Organisational dimension

Cross Tabulation Frequency/Percent

13. [Q20] The contact details of the business unit must be displayed

		Strongly Agree	Agree	Disagree	Strongly Disagree	**Row Totals**
3. [Q5] How many years of ex ...	Less than 5 years	32	41	9	1	**83**
		38.55%	**49.4%**	**10.84%**	**1.2%**	**27.76%**
	5 years and more but less than 10 years	60	55	16	0	**131**
		45.8%	**41.98%**	**12.21%**	**0%**	**43.81%**
	10 years and more but less than 15 years	18	29	10	0	**57**
		31.58%	**50.88%**	**17.54%**	**0%**	**19.06%**
	More than 15 years	9	12	5	2	**28**
		32.14%	**42.86%**	**17.86%**	**7.14%**	**9.36%**
	Column Total	**119**	**137**	**40**	**3**	**299**
	Column Percent	**39.8%**	**45.82%**	**13.38%**	**1%**	**100%**

Cross Tabulation Frequency/Percent

13. [Q20] The e-learning course must allow for learner registration.

3. [Q5] How many years of ex ...		Strongly Agree	Agree	Disagree	Strongly Disagree	**Row Totals**

Less than 5 years	31	45	7	0	**83**
	37.35%	**54.22%**	**8.43%**	**0%**	**27.95%**
5 years and more but less than 10 years	41	66	22	0	**129**
	31.78%	**51.16%**	**17.05%**	**0%**	**43.43%**
10 years and more but less than 15 years	20	29	7	1	**57**
	35.09%	**50.88%**	**12.28%**	**1.75%**	**19.19%**
More than 15 years	7	10	8	3	**28**
	25%	**35.71%**	**28.57%**	**10.71%**	**9.43%**
Column Total	**99**	**150**	**44**	**4**	**297**
Column Percent	**33.33%**	**50.51%**	**14.81%**	**1.35%**	**100%**

Cross Tabulation Frequency/Percent

13. [Q20] The e-learning course must have effective security measures.

3. [Q5] How many years of ex ...		Strongly Agree	Agree	Disagree	Strongly Disagree	**Row Totals**
Less than 5 years	52	30	1	0	**83**
	62.65%	**36.14%**	**1.2%**	**0%**	**27.76%**
5 years and more but less than 10 years	68	51	11	0	**130**
	52.31%	**39.23%**	**8.46%**	**0%**	**43.48%**

10 years and more but less than 15 years	28	22	7	1	**58**
	48.28%	**37.93%**	**12.07%**	**1.72%**	**19.4%**
More than 15 years	11	9	6	2	**28**
	39.29%	**32.14%**	**21.43%**	**7.14%**	**9.36%**
Column Total	**159**	**112**	**25**	**3**	**299**
Column Percent	**53.18%**	**37.46%**	**8.36%**	**1%**	**100%**

Cross Tabulation Frequency/Percent

13. [Q20] The e-learning course must have a privacy policy.

3. [Q5] How many years of ex ...	Strongly Agree	Agree	Disagree	Strongly Disagree	**Row Totals**
Less than 5 years	46	32	5	0	**83**
	55.42%	**38.55%**	**6.02%**	**0%**	**27.95%**
5 years and more but less than 10 years	54	54	20	1	**129**
	41.86%	**41.86%**	**15.5%**	**0.78%**	**43.43%**
10 years and more but less than 15 years	24	24	9	0	**57**
	42.11%	**42.11%**	**15.79%**	**0%**	**19.19%**
More than 15 years	11	7	6	4	**28**
	39.29%	**25%**	**21.43%**	**14.29%**	**9.43%**

	Column Total	135	117	40	5	297
	Column Percent	**45.45%**	**39.39%**	**13.47%**	**1.68%**	**100%**

Cross Tabulation Frequency/Percent

13. [Q20] The e-learning course must have a feedback policy.

		Strongly Agree	Agree	Disagree	Strongly Disagree	**Row Totals**
3. [Q5] How many years of ex ...	Less than 5 years	32	43	8	0	**83**
		38.55%	**51.81%**	**9.64%**	**0%**	**28.23%**
	5 years and more but less than 10 years	40	60	26	0	**126**
		31.75%	**47.62%**	**20.63%**	**0%**	**42.86%**
	10 years and more but less than 15 years	15	34	8	0	**57**
		26.32%	**59.65%**	**14.04%**	**0%**	**19.39%**
	More than 15 years	7	10	8	3	**28**
		25%	**35.71%**	**28.57%**	**10.71%**	**9.52%**
	Column Total	94	147	50	3	294
	Column Percent	**31.97%**	**50%**	**17.01%**	**1.02%**	**100%**

Cross Tabulation Frequency/Percent

13. [Q20] The e-learning course must have branded educational content.

		Strongly Agree	Agree	Disagree	Strongly Disagree	**Row Totals**
3. [Q5] How many years of ex ...	Less than 5 years	26	38	16	2	**82**
		31.71%	**46.34%**	**19.51%**	**2.44%**	**27.99%**
	5 years and more but less than 10 years	24	54	40	9	**127**
		18.9%	**42.52%**	**31.5%**	**7.09%**	**43.34%**
	10 years and more but less than 15 years	7	22	20	7	**56**
		12.5%	**39.29%**	**35.71%**	**12.5%**	**19.11%**
	More than 15 years	4	8	8	8	**28**
		14.29%	**28.57%**	**28.57%**	**28.57%**	**9.56%**
	Column Total	**61**	**122**	**84**	**26**	**293**
	Column Percent	**20.82%**	**41.64%**	**28.67%**	**8.87%**	**100%**

Cross Tabulation Frequency/Percent

13. [Q20] There must be time approved officially for online learning.

3. [Q5] How many years of ex ...		Strongly Agree	Agree	Disagree	Strongly Disagree	**Row Totals**
	Less than 5 years	28	36	17	2	**83**

	33.73%	**43.37%**	**20.48%**	**2.41%**	**27.76%**
5 years and more but less than 10 years	26	68	30	6	**130**
	20%	**52.31%**	**23.08%**	**4.62%**	**43.48%**
10 years and more but less than 15 years	18	24	13	3	**58**
	31.03%	**41.38%**	**22.41%**	**5.17%**	**19.4%**
More than 15 years	6	9	8	5	**28**
	21.43%	**32.14%**	**28.57%**	**17.86%**	**9.36%**
Column Total	**78**	**137**	**68**	**16**	**299**
Column Percent	**26.09%**	**45.82%**	**22.74%**	**5.35%**	**100%**

Cross Tabulation Frequency/Percent

13. [Q20] The steps followed with course development is correct.

3. [Q5] How many years of ex ...		Strongly Agree	Agree	Disagree	Strongly Disagree	**Row Totals**
	Less than 5 years	34	42	7	0	**83**
		40.96%	**50.6%**	**8.43%**	**0%**	**27.85%**
	5 years and more but less than 10 years	40	76	14	0	**130**
		30.77%	**58.46%**	**10.77%**	**0%**	**43.62%**
	10 years and more but	20	33	3	1	**57**

less than 15 years	**35.09%**	**57.89%**	**5.26%**	**1.75%**	**19.13%**
More than 15 years	10	10	8	0	**28**
	35.71%	**35.71%**	**28.57%**	**0%**	**9.4%**
Column Total	**104**	**161**	**32**	**1**	**298**
Column Percent	**34.9%**	**54.03%**	**10.74%**	**0.34%**	**100%**

Cross Tabulation Frequency/Percent

13. [Q20] The e-learning course must improve the organizations training.

3. [Q5] How many years of ex ...	Strongly Agree	Agree	Disagree	Strongly Disagree	**Row Totals**
Less than 5 years	35	42	5	0	**82**
	42.68%	**51.22%**	**6.1%**	**0%**	**27.99%**
5 years and more but less than 10 years	42	68	17	0	**127**
	33.07%	**53.54%**	**13.39%**	**0%**	**43.34%**
10 years and more but less than 15 years	13	37	5	1	**56**
	23.21%	**66.07%**	**8.93%**	**1.79%**	**19.11%**
More than 15 years	9	10	7	2	**28**
	32.14%	**35.71%**	**25%**	**7.14%**	**9.56%**
Column Total	**99**	**157**	**34**	**3**	**293**
Column Percent	**33.79%**	**53.58%**	**11.6%**	**1.02%**	**100%**

Cross Tabulation Frequency/Percent

13. [Q20] The e-learning course must be efficient.

		Strongly Agree	Agree	Disagree	Strongly Disagree	**Row Totals**
3. [Q5] How many years of ex ...	Less than 5 years	37	36	7	1	**81**
		45.68%	**44.44%**	**8.64%**	**1.23%**	**27.36%**
	5 years and more but less than 10 years	42	63	24	1	**130**
		32.31%	**48.46%**	**18.46%**	**0.77%**	**43.92%**
	10 years and more but less than 15 years	11	31	14	1	**57**
		19.3%	**54.39%**	**24.56%**	**1.75%**	**19.26%**
	More than 15 years	7	11	7	3	**28**
		25%	**39.29%**	**25%**	**10.71%**	**9.46%**
	Column Total	**97**	**141**	**52**	**6**	**296**
	Column Percent	**32.77%**	**47.64%**	**17.57%**	**2.03%**	**100%**

Cross Tabulation Frequency/Percent

13. [Q20] The e-learning course must have educationist satisfaction.

3. [Q5] How many years of ex ...		Strongly Agree	Agree	Disagree	Strongly Disagree	**Row Totals**
	Less than 5 years	37	42	3	1	**83**

	44.58%	**50.6%**	**3.61%**	**1.2%**	**28.14%**
5 years and more but less than 10 years	46	74	9	0	**129**
	35.66%	**57.36%**	**6.98%**	**0%**	**43.73%**
10 years and more but less than 15 years	12	40	**4**	0	**56**
	21.43%	**71.43%**	**7.14%**	**0%**	**18.98%**
More than 15 years	6	15	4	2	**27**
	22.22%	**55.56%**	**14.81%**	**7.41%**	**9.15%**
Column Total	**101**	**171**	**20**	**3**	**295**
Column Percent	**34.24%**	**57.97%**	**6.78%**	**1.02%**	**100%**

Cross Tabulation Frequency/Percent

13. [Q20] The e-learning course must have learner satisfaction.

3. [Q5] How many years of ex ...		Strongly Agree	Agree	Disagree	Strongly Disagree	**Row Totals**
Less than 5 years		50	33	0	0	**83**
		60.24%	**39.76%**	**0%**	**0%**	**27.95%**
5 years and more but less than 10 years		69	54	6	1	**130**
		53.08%	**41.54%**	**4.62%**	**0.77%**	**43.77%**
10 years and more but		20	36	1	0	**57**

less than 15 years	**35.09%**	**63.16%**	**1.75%**	**0%**	**19.19%**
More than 15 years	11	13	3	0	**27**
	40.74%	**48.15%**	**11.11%**	**0%**	**9.09%**
Column Total	**150**	**136**	**10**	**1**	**297**
Column Percent	**50.51%**	**45.79%**	**3.37%**	**0.34%**	**100%**

Cross Tabulation Frequency/Percent

13. [Q20] The organisation must evaluate success of the programme.

3. [Q5] How many years of ex ...	Strongly Agree	Agree	Disagree	Strongly Disagree	**Row Totals**
Less than 5 years	52	31	0	0	**83**
	62.65%	**37.35%**	**0%**	**0%**	**28.04%**
5 years and more but less than 10 years	74	47	8	0	**129**
	57.36%	**36.43%**	**6.2%**	**0%**	**43.58%**
10 years and more but less than 15 years	35	20	1	0	**56**
	62.5%	**35.71%**	**1.79%**	**0%**	**18.92%**
More than 15 years	16	9	2	1	**28**
	57.14%	**32.14%**	**7.14%**	**3.57%**	**9.46%**
Column Total	**177**	**107**	**11**	**1**	**296**

	Column Percent	**59.8%**	**36.15%**	**3.72%**	**0.34%**	**100%**

Cross Tabulation Frequency/Percent

13. [Q20] The e-learning course must reward good progress.

		Strongly Agree	Agree	Disagree	Strongly Disagree	**Row Totals**
3. [Q5] How many years of ex ...	Less than 5 years	32	**48**	3	0	**83**
		38.55%	**57.83%**	**3.61%**	**0%**	**27.95%**
	5 years and more but less than 10 years	37	76	17	0	**130**
		28.46%	**58.46%**	**13.08%**	**0%**	**43.77%**
	10 years and more but less than 15 years	15	30	9	2	**56**
		26.79%	**53.57%**	**16.07%**	**3.57%**	**18.86%**
	More than 15 years	7	14	5	2	**28**
		25%	**50%**	**17.86%**	**7.14%**	**9.43%**
	Column Total	**91**	**168**	**34**	**4**	**297**
	Column Percent	**30.64%**	**56.57%**	**11.45%**	**1.35%**	**100%**

Cross Tabulation Frequency/Percent

13. [Q20] There must be integrated with career paths.

3. [Q5] How many years of ex ...		Strongly Agree	Agree	Disagree	Strongly Disagree	**Row Totals**

Less than 5 years	25	53	4	0	**82**
	30.49%	**64.63%**	**4.88%**	**0%**	**27.99%**
5 years and more but less than 10 years	36	76	16	0	**128**
	28.12%	**59.38%**	**12.5%**	**0%**	**43.69%**
10 years and more but less than 15 years	13	33	9	0	**55**
	23.64%	**60%**	**16.36%**	**0%**	**18.77%**
More than 15 years	12	10	5	1	**28**
	42.86%	**35.71%**	**17.86%**	**3.57%**	**9.56%**
Column Total	**86**	**172**	**34**	**1**	**293**
Column Percent	**29.35%**	**58.7%**	**11.6%**	**0.34%**	**100%**

Cross Tabulation Frequency/Percent

13. [Q20] The e-learning course must have reach.

3. [Q5] How many years of ex ...		Strongly Agree	Agree	Disagree	Strongly Disagree	**Row Totals**
Less than 5 years		20	49	12	1	**82**
		24.39%	**59.76%**	**14.63%**	**1.22%**	**27.89%**
5 years and more but less than 10 years		25	69	29	6	**129**
		19.38%	**53.49%**	**22.48%**	**4.65%**	**43.88%**

10 years and more but less than 15 years	8	24	22	2	**56**
	14.29%	**42.86%**	**39.29%**	**3.57%**	**19.05%**
More than 15 years	3	10	8	6	**27**
	11.11%	**37.04%**	**29.63%**	**22.22%**	**9.18%**
Column Total	**56**	**152**	**71**	**15**	**294**
Column Percent	**19.05%**	**51.7%**	**24.15%**	**5.1%**	**100%**

THE ORGANISATIONAL DIMENSION

The significant relationships between the role towards e-learning and the Organisational Dimension

Cross Tabulation Frequency/Percent

13. [Q20] The e-learning course must allow for learner registration.

4. [Q6] What is your current ...		Strongly Agree	Agree	Disagree	Strongly Disagree	**Row Totals**
	I am a learner making use of e-learning to study.	18	18	4	0	**40**
		45%	**45%**	**10%**	**0%**	**13.38%**
	I am an educator/facilitator using e-learning in training.	31	47	16	0	**94**
		32.98%	**50%**	**17.02%**	**0%**	**31.44%**
	I am a manager involved with e-learning.	8	22	4	2	**36**
		22.22%	**61.11%**	**11.11%**	**5.56%**	**12.04%**
	I am an Instructional Designer.	25	30	10	0	**65**
		38.46%	**46.15%**	**15.38%**	**0%**	**21.74%**
	I am part of a support team of e-learning courses namely a media designer or instructional technologist or programmer or, network specialist, subject matter expert or quality specialist or sponsor.	3	14	3	2	**22**
		13.64%	**63.64%**	**13.64%**	**9.09%**	**7.36%**
	Other	14	20	8	0	**42**

	33.33%	47.62%	19.05%	0%	14.05%
Column Total	99	151	45	4	299
Column Percent	33.11%	50.5%	15.05%	1.34%	100%

Cross Tabulation Frequency/Percent

13. [Q20] The e-learning course must have branded educational content.

4. [Q6] What is your current ...	Strongly Agree	Agree	Disagree	Strongly Disagree	Row Totals
I am a learner making use of e-learning to study.	16	14	9	0	39
	41.03%	35.9%	23.08%	0%	13.22%
I am an educator/facilitator using e-learning in training.	25	36	26	6	93
	26.88%	38.71%	27.96%	6.45%	31.53%
I am a manager involved with e-learning.	0	21	9	5	35
	0%	60%	25.71%	14.29%	11.86%
I am an Instructional Designer.	10	22	26	7	65
	15.38%	33.85%	40%	10.77%	22.03%
I am part of a support team of e-learning courses namely a media designer or instructional technologist or programmer or, network specialist, subject matter expert or quality specialist or sponsor.	0	13	5	4	22
	0%	59.09%	22.73%	18.18%	7.46%

Other	10	16	10	5	**41**
	24.39%	**39.02%**	**24.39%**	**12.2%**	**13.9%**
Column Total	**61**	**122**	**85**	**27**	**295**
Column Percent	**20.68%**	**41.36%**	**28.81%**	**9.15%**	**100%**

Cross Tabulation Frequency/Percent

13. [Q20] The organisation must reward good progress.

4. [Q6] What is your current ...	Strongly Agree	Agree	Disagree	Strongly Disagree	**Row Totals**
I am a learner making use of e-learning to study.	17	22	1	0	**40**
	42.5%	**55%**	**2.5%**	**0%**	**13.38%**
I am an educator/facilitator using e-learning in training.	39	51	3	1	**94**
	41.49%	**54.26%**	**3.19%**	**1.06%**	**31.44%**
I am a manager involved with e-learning.	8	24	1	3	**36**
	22.22%	**66.67%**	**2.78%**	**8.33%**	**12.04%**
I am an Instructional Designer.	27	35	4	0	**66**
	40.91%	**53.03%**	**6.06%**	**0%**	**22.07%**
I am part of a support team of e-learning courses namely a media designer or instructional technologist or programmer or, network specialist, subject matter	4	17	1	0	**22**
	18.18%	**77.27%**	**4.55%**	**0%**	**7.36%**

expert or quality specialist or sponsor.					
Other	16	20	5	0	**41**
	39.02%	**48.78%**	**12.2%**	**0%**	**13.71%**
Column Total	**111**	**169**	**15**	**4**	**299**
Column Percent	**37.12%**	**56.52%**	**5.02%**	**1.34%**	**100%**

The significant relationships between the context of involvement with e-learning and the Organisational dimension

Cross Tabulation Frequency/Percent

13. [Q20] There must be time allowed for e-learning .

		Strongly Agree	Agree	Disagree	Strongly Disagree	**Row Totals**
5. [Q8] What is the context ...	University, college or other institution for further education and training.	64	112	49	9	**234**
		27.35%	**47.86%**	**20.94%**	**3.85%**	**77.74%**
	School for children.	4	5	4	2	**15**
		26.67%	**33.33%**	**26.67%**	**13.33%**	**4.98%**
	The workplace (any business, industry etc.)	6	14	11	1	**32**
		18.75%	**43.75%**	**34.38%**	**3.12%**	**10.63%**
	Other	4	7	4	5	**20**
		20%	**35%**	**20%**	**25%**	**6.64%**
	Column Total	**78**	**138**	**68**	**17**	**301**
	Column Percent	**25.91%**	**45.85%**	**22.59%**	**5.65%**	**100%**

Cross Tabulation Frequency/Percent

13. [Q20] The steps followed in course development are correct.

5. [Q8] What is the context ...		Strongly Agree	Agree	Disagree	Strongly Disagree	**Row Totals**

University, college or other institution for further education and training.	78	134	21	0	**233**
	33.48%	**57.51%**	**9.01%**	**0%**	**77.67%**
School for children.	3	9	2	1	**15**
	20%	**60%**	**13.33%**	**6.67%**	**5%**
The workplace (any business, industry etc.)	17	10	5	0	**32**
	53.12%	**31.25%**	**15.62%**	**0%**	**10.67%**
Other	6	9	5	0	**20**
	30%	**45%**	**25%**	**0%**	**6.67%**
Column Total	**104**	**162**	**33**	**1**	**300**
Column Percent	**34.67%**	**54%**	**11%**	**0.33%**	**100%**

Cross Tabulation Frequency/Percent

13. [Q20] The e-learning course must have instructions to work online.

5. [Q8] What is the context ...		Strongly Agree	Agree	Disagree	Strongly Disagree	**Row Totals**
	University, college or other institution for further education and training.	85	126	19	0	**230**
		36.96%	**54.78%**	**8.26%**	**0%**	**77.44%**
	School for children.	8	5	2	0	**15**
		53.33%	**33.33%**	**13.33%**	**0%**	**5.05%**

	The workplace (any business, industry etc.)	13	10	9	0	**32**
		40.62%	**31.25%**	**28.12%**	**0%**	**10.77%**
	Other	6	10	3	1	**20**
		30%	**50%**	**15%**	**5%**	**6.73%**
	Column Total	**112**	**151**	**33**	**1**	**297**
	Column Percent	**37.71%**	**50.84%**	**11.11%**	**0.34%**	**100%**

Cross Tabulation Frequency/Percent

13. [Q20] The e-learning course must have learner satisfaction.

		Strongly Agree	Agree	Disagree	Strongly Disagree	**Row Totals**
5. [Q8] What is the context ...	University, college or other institution for further education and training.	114	113	6	0	**233**
		48.93%	**48.5%**	**2.58%**	**0%**	**77.93%**
	School for children.	4	9	1	1	**15**
		26.67%	**60%**	**6.67%**	**6.67%**	**5.02%**
	The workplace (any business, industry etc.)	21	9	1	0	**31**
		67.74%	**29.03%**	**3.23%**	**0%**	**10.37%**
	Other	12	6	2	0	**20**
		60%	**30%**	**10%**	**0%**	**6.69%**

	Column Total	**151**	**137**	**10**	**1**	**299**
	Column Percent	**50.5%**	**45.82%**	**3.34%**	**0.33%**	**100%**

Cross Tabulation Frequency/Percent

13. [Q20] There must be enough support personnel.

		Strongly Agree	Agree	Disagree	Strongly Disagree	**Row Totals**
5. [Q8] What is the context ...	University, college or other institution for further education and training.	121	99	11	0	**231**
		52.38%	**42.86%**	**4.76%**	**0%**	**77.52%**
	School for children.	7	7	1	0	**15**
		46.67%	**46.67%**	**6.67%**	**0%**	**5.03%**
	The workplace (any business, industry etc.)	17	15	0	0	**32**
		53.12%	**46.88%**	**0%**	**0%**	**10.74%**
	Other	11	5	3	1	**20**
		55%	**25%**	**15%**	**5%**	**6.71%**
	Column Total	**156**	**126**	**15**	**1**	**298**
	Column Percent	**52.35%**	**42.28%**	**5.03%**	**0.34%**	**100%**

APPENDIX F

PHASE THREE: FOCUS GROUP DISCUSSION OF THE INITIAL AUDIT TOOL

<table>
<tr><td>Standard/Criterion</td><td>Audit element to look for (Audit done through inspection and interviews)
Answer yes only when all criteria are met. If no describe in the comments row which elements are missing and explain if necessary.</td><td colspan="2">Equivalent Question Paper (to be given to target population)</td><td colspan="2">Target population for Question</td></tr>
<tr><td>A Human Resource Dimension</td><td></td><td colspan="4"></td></tr>
<tr><td rowspan="3">The learner must have the necessary cognitive skills for e-learning (thinking abilities)</td><td rowspan="3">The introduction of the course specifies the attributes the learner needs to complete the course namely, must be able to reason and solve problems, have conceptual thinking abilities, able to make meaning out of newly constructed knowledge, able to reflect, analyse, able to learn (knows how to learn).
Auditor's action: observe introduction of online course.
Yes:
No :
Comments:</td><td colspan="2">The learners possess the necessary cognitive skills for E-learning.</td><td colspan="2">Educator</td></tr>
<tr><td>1</td><td>2</td><td>3</td><td>4</td></tr>
<tr><td>0-25% true</td><td>26 – 50% true</td><td>51 – 75% true</td><td>76 – 100% true</td></tr>
</table>

<table>
<tr><td rowspan="3">The learner must be mentally ready for the e-learning program (psychologically ready)</td><td rowspan="3">N/A</td><td colspan="2">I am ready to start the course. All my fears have been addressed.</td><td colspan="2">Learner</td></tr>
<tr><td>1</td><td>2</td><td>3</td><td>4</td></tr>
<tr><td>0-25% true</td><td>26 – 50% true</td><td>51 – 75% true</td><td>76 – 100% true</td></tr>
<tr><td rowspan="3">The learner must have the necessary computer skills to operate the computer and the learning program (technical ability)</td><td rowspan="3">In the beginning (introduction) there is specific computer skills requirements listed (ability to retrieve information, use assessment tools, communicate through e-mail, chat rooms, bill boards etc., create text and graphic documents, know referencing techniques).
Auditor's action: observe introduction of online course.
Yes:
No :
Comments:
The skills are tested by way of an instrument or questions. Extra training is provided where necessary.
Auditor's action: observe introduction of online course/ask educator for proof.
Yes:
No :
Comments:</td><td colspan="2">The computer skills that I need for the e-learning course were described and tested beforehand.</td><td colspan="2">Learner</td></tr>
<tr><td>1</td><td>2</td><td>3</td><td>4</td></tr>
<tr><td>0-25% true</td><td>26 – 50% true</td><td>51 – 75% true</td><td>76 – 100% true</td></tr>
</table>

<table>
<tr>
<td rowspan="9">The learner must possess the correct E-learning behaviours (attitudes, believe system)</td>
<td rowspan="9">The introduction in the beginning of the course specifies the attributes the learner needs to complete the course namely, self directedness, work independently as well as in collaboration with others, participation, open minded, able to learn in various ways, positive attitude.
Auditor's action: observe introduction of online course.
Yes:
No :
Comments:

Links are given to web sites to help the learner determine whether online learning is appropriate for them like the Guglielmino self directed learning readiness test and or the Learning preference assessment.

Auditor's action: observe introduction of online course.
Yes:
No :

Comments:</td>
<td colspan="2">I know how to learn and make use of several learning methods.</td>
<td colspan="2">Learner</td>
</tr>
<tr>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>Not sure</td>
<td>Poor</td>
<td>Fair</td>
<td>Good</td>
</tr>
<tr>
<td colspan="2">I like learning on my own and can stick to the plan.</td>
<td colspan="2">Learner</td>
</tr>
<tr>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>Not sure</td>
<td>Poor</td>
<td>Fair</td>
<td>Good</td>
</tr>
<tr>
<td colspan="2">The learners participate acti4vely through communicating via E-mail, chat rooms, direct dialogue (phone, face to face communication).</td>
<td colspan="2">Educator</td>
</tr>
</table>

		1	2	3	4
		Not sure	Poor	Fair	Good
		The employee learners can take the content/knowledge/ apart, analyse it and put it together again with giving it a new meaning.		Educator	
		1	2	3	4
		Not sure	Poor	Fair	Good
		The learners approach new learning experiences with open minds, questions, analysis, listening, writing and discussions.		Educator	
		1	2	3	4
		Not sure	Poor	Fair	Good

<table>
<tr><td rowspan="3">The Educator must be mentally ready for E-learning</td><td rowspan="3">N/A</td><td colspan="2">I am ready to facilitate the course. All my fears have been addressed.</td><td colspan="2">Educator</td></tr>
<tr><td>1</td><td>2</td><td>3</td><td>4</td></tr>
<tr><td>Not sure</td><td>Poor</td><td>Fair</td><td>Good</td></tr>
<tr><td rowspan="7">The Educator must have the necessary skills and attitudes for E-learning</td><td rowspan="7">Must have proof of training as a facilitator (certificate etc.)

Auditor's action: ask facilitator for proof of training.
Yes:
No :
Comments:</td><td colspan="2">I receive satisfactory personal attention from the program facilitator.</td><td colspan="2">Learner</td></tr>
<tr><td>1</td><td>2</td><td>3</td><td>4</td></tr>
<tr><td>Not sure</td><td>Poor</td><td>Fair</td><td>Good</td></tr>
<tr><td colspan="2">My e-learning program and system administration skills are satisfactory.</td><td colspan="2">Educator</td></tr>
<tr><td>1</td><td>2</td><td>3</td><td>4</td></tr>
<tr><td>Not sure</td><td>Poor</td><td>Fair</td><td>Good</td></tr>
<tr><td colspan="2">The facilitator succeeds in creating the right environment for</td><td colspan="2">Learner</td></tr>
</table>

		collaboration, communication and learning to take place.			
		1	2	3	4
		Not sure	Poor	Fair	Good
		I learn new things through the e-learning event and consider myself a valuable resource for any help the learner needs		Educator	
		1	2	3	4
		Not sure	Poor	Fair	Good
		I am positive about the e-learning event.		Educator	
		1	2	3	4
		Not sure	Poor	Fair	Good

<table>
<tr><td rowspan="3">Plan for dissemination of information</td><td rowspan="3">Learners are involved in the planning phase and prepared in the use of the program. They are represented by learner representative on the planning committees. Attendance list indicate the presence of the individual.
Auditor's action: inspect minutes and attendance list of meetings.
Yes:
No :
Comments:</td><td colspan="2">I or my employee representatives have been involved in the planning of and roll out of the program.</td><td colspan="2">Learner</td></tr>
<tr><td>1</td><td>2</td><td>3</td><td>4</td></tr>
<tr><td>Not sure</td><td>Poor</td><td>Fair</td><td>Good</td></tr>
<tr><td rowspan="3">Allow time for people to change/adapt</td><td rowspan="3">Employees were/are given enough time to get used to the new e-learning program. This is evident from awareness training session implemented as well as a project plan including change management with realistic timelines and trial sessions/pilot sessions used to introduce the program.
Auditor's action: inspect project plan. Ask for proof of awareness training sessions/trial sessions.
Yes:
No :
Comments:</td><td colspan="2">I have been given enough time to get used to the new e-learning program.</td><td colspan="2">Learner</td></tr>
<tr><td>1</td><td>2</td><td>3</td><td>4</td></tr>
<tr><td>Not sure</td><td>Poor</td><td>Fair</td><td>Good</td></tr>
</table>

Safe working environment during the trial period	Employees were/are comfortable that they were/are given enough privacy/room to try the program. The tracking abilities *of the program have been* cancelled during the roll out stages or no responses/feedback was given to learners allowing them complete privacy. Auditor's action: inspect administration capabilities of program. Ask educator. Did they track learners during the trial period and provided feedback? Yes: No : Comments:	I am comfortable that during the initial stages of the learning event I was allowed enough privacy to test the program in order to get used to it.		Learner	
		1	2	3	4
		Not sure	Poor	Fair	Good
Have the necessary subject matter pre knowledge or entry level requirements	Employees have the necessary pre knowledge to follow the course stated clearly in the beginning *(introduction)* of the course. There must be *statements on prior knowledge requirements* i.e. must have a specific qualification or knowledge with or without a *test instrument* to test knowledge readiness. Auditor's action: observe introduction of online course Yes: No : Comments:	The learners have been screened to make sure that they possess the necessary pre knowledge or qualifications necessary to follow the course.		Educator	
		1	2	3	4
		Not sure	Poor	Fair	Good

Human Resources and IT administration training.	Administrators and Educators have been trained to use the administrative tools of the course. Evidence of *training sessions and attendance lists*. Auditor's action: Ask for attendance list Yes: No : Comments:	I attended training and can use the administrative tools of the e-learning course.		Educator	
		1	2	3	4
		Not sure	Poor	Fair	Good
B Technology Dimension					
Material should appeal to both hemispheres of the brain (engaging)	Presentations are done through attractive *visual* presentations, *auditory* stimulation and *kinesthetic* stimulation and engage the learner by eliciting *participation* in the learning event. Auditor's action: Inspection of online course Yes: No : Comments:	The program engages me (entice me, involves me, allows me) to participate through interesting visual presentations AND sound projections AND moving objects (all three) that appeals to me		Learner	
		1	2	3	4
		Not sure	Poor	Fair	Good

Aesthetically adds value	Appealing format:- *Colour*, *letter* type, page *length*, *headings*, *margins, contrast, positioning* of graphics, clarity, *alignment*, attractiveness, *frames*. *Numbers* clearly indicate sequence in tasks or processes. *Bullets* are used where prioritisation by numbers are not needed. Bullets, numbers and dashes are used *consistently* throughout the program. Typeface used is acceptable to the content and common to all programs. Bold face is used sparingly and only where important material have to be highlighted. Capital letters and underlining are not used to emphasize. Headings and subheadings are used to organise content consistently. *Keywords* are highlighted. Pages are *uncluttered* and leave space. Justification used to rectify ragged right margins. Contrast between the text and background makes reading text easy. All graphics, tables, photos further clarify the content - is linked to the content. Illustrations are clear. *JPEG* files are used to accommodate download speeds. *Graphics are textually explained* and text is aligned with graphics. If frames are used it must be used consistently throughout. Consistent use of all abovementioned requirements. Auditor's action: Inspection of online course	The overall appearance of the program is appealing.	Learner
	Colour Yes: No : Comments:	The overall appearance of the program is appealing.	

	Colour	Font	Page length	Headings	Margins	Contrast	positioning	Clarity	Alignment	frames	Numbers	Bullets	Keywords	justification	Consistency	Jpeg	1	2	3
											Not sure		Poor		Fair		Good		
The technological infrastructure must be able to support the program without interfering the existing load	The network, technical back end and desktop *requirements* are clearly defined - *known, listed* in introduction or in strategy. A list of technical requirements for end user computers appear in the beginning *(introduction)* of the program. (I.e. modem speed, internet bandwidth, hardware requirements*).* *No interference in download time a*nd accessibility and use of the program pages and or graphics. A *test* has been done to determine the number of learners that can easily be managed by the server and existing infrastructure. Auditor's action: Inspection of online course introduction or strategy. Ask for technical data. Ask for test results. Yes: No : Comments:																		
											The program's operating speed and download time is good				Learner				
											1		2		3		4		
											Not sure		Poor		Fair		Good		

Help line for technical support	A *technical support help line* and or links to technical information are visible and available and working and displayed in the *introduction* - someone that can help on the other side is available immediately. The time during which the technical support is available is stated clearly. Auditor's action: Inspection of online course Yes: No : Comments:	A technical help line number is available and functional during online training periods.		Educator	
		1	2	3	4
		Not sure	Poor	Fair	Good
Have printable version option	There is a *printable option available* and displayed in the pages of the program. Auditor's action: Inspection of online course Yes: No : Comments:	The printing options in the program is available and working		Educator	
		1	2	3	4
		Not sure	Poor	Fair	Good

Easy access address	The program is *accessible immediately* after loading or clicking on the address. Auditor's action: Inspection of online course Yes: No : Comments:	Accessing the program is easy and simple		Learner	
		1	2	3	4
		Not sure	Poor	Fair	Good
Consistent navigation bars between pages	Navigation bars are used *consistently* (look and open up in the same manner) throughout the program. Each page/or screen frame or interface page contains the following *links*: - a link to the next and previous page, to start of the module, beginning of the course, e-mail, and other parts of the course. *Page headers or footers indicate* where the learner is in the course. Auditor's action: Inspection of online course Yes: No : Comments:	Good		Educator	
		1	2	3	4
		Not sure	Poor	Fair	

<table>
<tr><td rowspan="6">Hyperlinks clearly indicate where they will lead</td><td rowspan="6">Hyperlinks clearly indicate where they will lead and size of download files is present. Links to other parts or external sources are operating and correct.
Auditor's action: Inspection of online course
Yes:
No :
Comments:</td><td colspan="2">Hyperlinks clearly indicate where they will lead and it is working</td><td colspan="2">Educator</td></tr>
<tr><td>1</td><td>2</td><td>3</td><td>4</td></tr>
<tr><td>Not sure</td><td>Poor</td><td>Fair</td><td>Good</td></tr>
<tr><td colspan="2">Hyperlinks indicate the size of the files that can be downloaded where linked to downloadable information</td><td colspan="2"></td></tr>
<tr><td>1</td><td>2</td><td>3</td><td>4</td></tr>
<tr><td>Not sure</td><td>Poor</td><td>Fair</td><td>Good</td></tr>
<tr><td rowspan="4">Scalable technology</td><td rowspan="4">Available anywhere, anyplace, anytime to the entire organisation without disturbing existing technology infrastructure.
Auditor's action: Inspection of delivery system
Yes:
No :
Comments:</td><td colspan="2">The program is available anytime, anywhere, anyplace for learning and information purposes</td><td colspan="2">Educator</td></tr>
<tr><td>1</td><td>2</td><td>3</td><td>4</td></tr>
<tr><td>Not sure</td><td>Poor</td><td>Fair</td><td>Good</td></tr>
<tr><td colspan="4"></td></tr>
</table>

Technical simplicity	The program easily operable by making use of a point and click system. Auditor's action: Inspection of online course Yes: No : Comments:	I can operate the program easily		Learner	
		1	2	3	4
		Not sure	Poor	Fair	Good
Centralised tracking and administration	Possess an administrative *tool* enabling learner *assessments, reports, progress tracking, and learner satisfaction evaluation tools* Auditor's action: Inspection of online course Yes: No : Comments:	The program possess an administrative tool enabling learner assessments, reports, progress tracking, and learner satisfaction evaluation tools		Educator	
		1	2	3	4
		Not sure	Poor	Fair	Good

<table>
<tr><td rowspan="3">Easy access to information once the program has been accessed</td><td rowspan="3">Information is easily found due to a detailed table of contents and site map in the beginning (introduction) of the course.
Auditor's action: Inspection of online course
Yes:
No :
Comments:</td><td colspan="2">Finding information is made easier because there is a detailed table of contents (index) and a site map in the beginning (introduction) of the course.</td><td colspan="2">Learner</td></tr>
<tr><td>1</td><td>2</td><td>3</td><td>4</td></tr>
<tr><td>Not sure</td><td>Poor</td><td>Fair</td><td>Good</td></tr>
<tr><td rowspan="3">Use the appropriate e-learning delivery system</td><td rowspan="3">n/a</td><td colspan="2">The computer technology delivery system chosen for the online course is sufficient to support learning needs</td><td colspan="2">Learner</td></tr>
<tr><td>1</td><td>2</td><td>3</td><td>4</td></tr>
<tr><td>Not sure</td><td>Poor</td><td>Fair</td><td>Good</td></tr>
<tr><td>C Pedagogy Resources Dimension</td><td></td><td colspan="2"></td><td colspan="2"></td></tr>
</table>

	The epistemological assumptions of knowledge construction is supportive of the Constructivist Philosophy on knowledge construction and incorporates the characteristics of the Constructivist view of meaningful learning namely engaging activity, generated knowledge, collaborative, conversational, intentional, complex and reflective.				
Appropriate interaction typology for collaboration and conversation.	The various types of interaction typologies (synchronous or asynchronous) each takes place in its own virtual space and involve the correct person/s (individual or group work and or access to other organisations or experts in the particular field). A variety of typologies are used to promote conversation. Clear indications are given on grouping of learners for team based activities. Expectations and responsibilities regarding collaborative activities are spelled out. Instructions are given on when to use which typology (synchronous or asynchronous). Individual communication from learner to facilitator is possible. The communication flow is clearly described and created by the relevant role players. Learners are encouraged to collaborate and the value thereof are pointed out to them in the beginning (introduction) of the course. The program does not make use of e-	The interaction tools used in the program (e-mail, chat rooms, bill boards, video conferencing etc) are separated from each other and the right number and type of person/s participates in the activity.		Educator	
		1	2	3	4
		Not sure	Poor	Fair	Good

	reading and a telling style of knowledge sharing.				
Humanised the class/learning group	The program design provides opportunities to converse with other learners. Evidence of a space where learners are introduced to each other and share information about themselves.	The program provides a space where learners can be introduced to each other and share information about themselves.		Educator	
		1	2	3	4
		Not sure	Poor	Fair	Good
Appropriate educational activities	Frequent opportunities (the number is satisfactory to support learning) for activities like discussions, collaborative work, projects & exercises *appropriate/suited to* the learning suppose to take place are present. They are sequenced logically throughout the program. Activities encourage critical thinking, problem solving and creative thinking (generative). It develops appropriate cognitive, affective and psychomotor skills. Activities engage the learner in frequently drawing him into responding to questions, select, reproduce and give feedback, contact others. There is reflective activities expecting learners to explain how they came to conclusions, what strategies were used, what were their thought	Activities like discussions, collaborative work, projects & exercises are *appropriate/suited to* the learning suppose to take place.		Educator	
		1	2	3	4
		Not sure	Poor	Fair	Good

	processes. Does the program *engage* the user through novelty, humour, game elements, testing, adventure, unique content, surprise elements etc.?				
Goal orientation must be appropriate to the type of learning to take place (intentional learning)	A set of goals/outcomes of the course are listed in the beginning of the program. The learner can choose which goals he wants to do to meet the outcome. Outcomes are appropriate to the type of learning to take place (Introduction -clear, measurable and outlined at the beginning of each module) They are related to the real world (work place). They include knowledge, attitude, skills, behaviours and competencies. They are written in a Constructivist manner i.e. Japan sells more computers than other nation. Analyse the potential of trade war between Japan and USA. They start with action words (verbs). Outcomes are written on different levels clearly indicating which require critical thinking skills for the more difficult levels (consider Blooms hierarchy of competencies). The outcomes follow a sensible sequence of events. There is evidence that the course has been piloted and that outcomes are achievable.	N/A		N/A	

The problems presented must be complex and authentic, and possess experiential validity that is concrete not abstract	The activities and content must reflect the real work environment. There is a set of related problem cases presented as point of reference. The problems presented are ill structured and complex like in the real world.	Real work related problem cases are presented to the learner from which he can draw his own conclusion during learning activities.		Educator	
		1	2	3	4
		Not sure	Poor	Fair	Good
Provide for any possible/foreseen resources	In the beginning *(introduction)* of the course there is a list of required (compulsory) and recommended (optional) resources with instructions on how to use it and where to find it. There is enough variety in the resources to provide for the differences in interests, ability and learning styles of the learners. Resources with different point of views are used when appropriate. Clear indications of resources inclusive of and beyond the course material to be used at different points of the program where it is needed. Resources are accessible, appropriate and accurate (current and related to the course). There is also a frequently asked questions page to address the most questions asked. There is an index list with key words/glossary with explanations thereof. A reference list including a variety of material used includes books, articles, web	The learner can immediately access the right information resources at the right moment that he needs it.		Educator	
		1	2	3	4
		Not sure	Poor	Fair	Good

	sites etc at the end of the program.				
Make use of instructional processes designed for knowledge construction	There is evidence of modeling. There is evidence of scaffolding cognitive tools. There is evidence of hints or coaching where needed.	There is efficient use of instructional processes like modeling, scaffolding and hinting/coaching right through the program to assist the learning process.		Educator	
		1	2	3	4
		Not sure	Poor	Fair	Good
Cultural sensitivity	Evidence that diversity is respected by content not being biased in any way with regards to age, culture, ethnicity, race, gender, sexual preference.	I find the program to be sensitive to my age, race, gender and culture and it does not offend my cultural values.		Learner	
		1	2	3	4
		Not sure	Poor	Fair	Good

E-learning must comply with the principles of adult learning	Evidence that the adult learner (is self directed) control his own learning i.e. manage own time, navigation, activities. He is allowed to relate, link, refer to his own experience or is asked to use it. It relates to is job in the sense that it is contextualised and provides career advancement opportunities. He can collaborate, negotiate with others.	The program allows me to work independently and control/direct my own learning event.		Learner	
		1	2	3	4
		Not sure	Poor	Fair	Good
		I am allowed to make use of my own work experiences to relate to during discussions and exercises.			
		1	2	3	4
		Not sure	Poor	Fair	Good
		The program fulfils my need to be more efficient at work and further my chances to obtain a better job opportunity/position.			
		1	2	3	4
		Not sure	Poor	Fair	Good
		The program has enough *tools* to fulfill my needs to collaborate and discuss the work with other people.			

		1	2	3	4
		Not sure	Poor	Fair	Good
The physical learning environment must be conducive to learning	The physical environment is conducive to learning, no disruptions, noise, visual disturbances, ergonomics, and temperature.	The physical learning environment in which I use the program is conducive to learning.		Learner	
		1	2	3	4
		Not sure	Poor	Fair	Good
Face to face contact sessions	Contact sessions dates and venues are clearly indicated as part of the program	There are contact sessions that can be attended to discuss the work.		Educator	
		1	2	3	4
		Not sure	Poor	Fair	Good
Appropriate online learning time	A list of instructions on sensible ways of time management is given in beginning of course *(introduction).* Instructions on timelines for completion of the course and dates for completion of activities within the course. Consequences for not meeting deadlines are explained. Learners can follow their own pace within preset timeframe and repeat sections if they want to.	Instruction on how much time is to be spent on the program is given and the advice is useful.		Learner	
		1	2	3	4
		Not sure	Poor	Fair	Good

The program relate to the character of the subject and the users	The tone of the program is informal/conversational and relates to the character of the subject as well as the target group (use second person refers to you not the learner). The organisation and sequencing of the course content matches the character of the subject matter as well as the character of the learner target group. The writing style is clear a direct. Directions/instructions given are clear. Words are familiar and common to the subject and the learner. Verbs are in active voice not passive voice i.e. the teacher poured the coffee not the coffee was poured by the teacher. Sentences are short. Paragraphs brief and to the point. General tone is supportive and encouraging. Terms are not changed and are used consistently. All abbreviations are defined. Symbols are explained. Grammar is simple and accurate. Spelling is correct.	The general tone, look and feel of the program is suited to the character of the subject and the users (learners).		Educator	
		1	2	3	4
		Not sure	Poor	Fair	Good
Flexible to provide for individual needs	Instructions that indicate different routes to be followed through the program as well as flexibility regarding time are explained. Various activity options are given from which the learner can choose according to his age, cultural background and experience.	I am allowed to follow my own path and use my own timetable through the course.		Learner	
		1	2	3	4
		Not sure	Poor	Fair	Good

Course architecture in manageable appropriate logically sequenced chunks of knowledge	The content is sensibly and consistently divided in knowledge domains/modules. Each module consistently follows the same sequence i.e. introduction, content, end, test. Each module starts with a preview. The table of contents provides a clear indication of how the material is arranged. Each module is divided in subunits (small manageable incremental steps). Subunits relate to the main topic. Core required course content is clearly separated from supplementary material if any. Modules are summarised throughout material. Content arranged sequentially according to difficulty.	The program material is sensibly divided in modules and each module follows the same sequence of events.		Educator	
		1	2	3	4
		Not sure	Poor	Fair	Good
The program is modifiable or not, thus flexible or inflexible and "teacher - proof"	Evidence that the program can be modified	The program can be modified/changed to meet the learners' needs.		Educator	
		1	2	3	4
		Not sure	Poor	Fair	Good
Identify the correct learner population group	A list of pre requisites or co requisites are listed in the beginning *(introduction)* of the course. The content is relevant, appropriate to the learner and presented at the right moment in his career	The course content is relevant and appropriate to my job and presented at the right moment in my career. Or The learning material has a connection with and is suitable to the work I do.		Learner	
		1	2	3	4
		Not sure	Poor	Fair	Good

Should require less adjustment from previous learning experience	The learner considers the learning event to be easier than traditional classroom learning	I consider the learning event to be easier than traditional classroom learning.		Learner	
		1	2	3	4
		Not sure	Poor	Fair	Good
Allow for learner autonomy and self pacing	The program provide enough opportunity for the learner to exercise his own learning decisions and work at his own pace within the constraints of the program time limits. It also allows the learner to differ from others and resist coercion.	The learner is allowed to plan his own learning and overcome his own obstacles in his own time.		Educator Educator Learner	
		1	2	3	4
		Not sure	Poor	Fair	Good
		The program provides the learner with difficult tasks to solve in his own way.			
		1	2	3	4
		Not sure	Poor	Fair	Good
		I am allowed to differ from others, come to my own conclusions.			
		1	2	3	4
		Not sure	Poor	Fair	Good

Appropriate relationship between transactional distance and learner autonomy maintained	The learner and facilitator are comfortable with the balance maintained between learner autonomy and facilitator support being given.	The program is designed such that I know what is expected of me to do most of the time, and when I don't support is available.		Learner	
		1	2	3	4
		Not sure	Poor	Fair	Good
Quick feedback time	Guidelines on availability of the facilitators are listed as well as the turnaround time. Feedback falls within the pre determined time limits, ideally within 24 hours. The feedback is constructive relevant and frequent.	I receive relevant constructive timely feedback within the set timeframe		Learner	
		1	2	3	4
		Not sure	Poor	Fair	Good
Appropriate allocation of time and resources to activities	The activities indicate specific people, material & time to be used for learning & technical support. The number of assignments and time provided to complete them is reasonable.	The learner are given enough time and support to complete activities		Educator	
		1	2	3	4
		Not sure	Poor	Fair	Good

Extra attention should be given to the learners' reading, writing skills and language abilities.	A reading proficiency test and a score to qualify for the course are listed in the beginning of the course. The learners reading, writing and language skills were tested in the same language that the program is written - proof provided. The program accommodates/provides extra support to those who is studying in their second or third language. The level of language application is appropriate to the target group. The design accommodates colour-blindness, pages can zoom in/enlarge, sound is also replaced with text for those who cannot hear	All learners undergo a test to determine their reading, writing and language skills and the program provides extra support to those who study in their second or third language.		Educator	
		1	2	3	4
		Not sure	Poor	Fair	Good
Assessment during the process of learning	The program makes use of formative assessment. There is evidence of portfolio work or other types of assessments. There is more than one assignment allocated to an outcome from which the learner can choose from to prove competence. There is a variety of evaluative tools/exercises the learner can choose from. Evaluation and grading procedures are clearly described and explicit (clearly understood). Each assignment and evaluative tool has clear step by step instruction for clarity of learner expectations (including any peer reviews, assignments, online participation etc). Clear guidelines for assignment submission are given. The educator can provide evidence of matching the evaluative tools with the assessment criteria of	Various methods are used to assess the learners' performance whilst still busy with the learning program.		Educator	
		1	2	3	4
		Not sure	Poor	Fair	Good

	each outcome (criteria mapping). Information is provided on the percentage representation of assignments versus final assessments. The criteria used to evaluate participation in online activities are described. Evaluative exercises are relevant to the careers/job profiles of the learner. The learner can track his own progress. Self tests if present are similar to the final evaluation instrument.				
Appropriate match between size of virtual group and educational strategies	The Educator/facilitator can manage all learners needs with ease within the prescribed timeframe (synchronously or asynchronous). There is evidence of decisions and or pilot studies to determine exactly how many learners are to be enrolled per facilitator (policy, works instruction or other written or evidence).	The size of the virtual learning group did not interfere with my facilitation abilities.		Educator	
		1	2	3	4
		Not sure	Poor	Fair	Good
D Organisatio-nal Dimen-sion					
Necessary contact numbers on the front/home page	The contact details of the particular business owner of the course are clearly displayed on the front/beginning *(introduction)* of the course.	The necessary department who runs the course' contact numbers has been provided on the front page of the program.		Manager	
		1	2	3	4
		Not sure	Poor	Fair	Good

Provide space for registration	There is space on the program for registration purposes where learner particulars and passwords can be loaded	Each learner registered for the course and received/created his/her own password for security purposes.		Educator	
		1	2	3	4
		Not sure	Poor	Fair	Good
Effective security measures to ensure credibility	In the beginning *(introduction)* of the course there is published information on regulations regarding and consequences in breech of virus protection, plagiarism, referencing copyrighted material and firewalls used. There is evidence that security measures are foolproof. There are published policies on assessment procedures. The learners have passwords.	Provided the learner protect his password his work is safe and secure and no one else have access to his work or him having access to the work of others.		Educator	
		1	2	3	4
		Not sure	Poor	Fair	Good
Published privacy policy	There is a privacy policy in the beginning *(introduction)* of the program describing the learner's right to privacy and the conditions under which their names and online submissions may be shared with others.	The learning site has a privacy policy which is published and is accessible to learners on entering the course		Manager	
		1	2	3	4
		Not sure	Poor	Fair	Good

Feedback regulations stipulated	Evidence of a set of feedback regulations/policy visible in the *introduction* program	A feedback policy exists and it has been communicated to the learners on the particular learning site.		Manager	
		1	2	3	4
		Not sure	Poor	Fair	Good
Branded educational content	Evidence that dates for review exist or other methods used to keep content current and accurate. (Team of experts or a published continual improvement process) Evidence that the course has been edited for grammar, spelling, language. Content relevant and complete to address all outcomes (criteria map exists). Content checked by a second subject matter expert. I packaged bought evidence of date of manufacturing/ design of course is still in the recent past (2 years?).	Content are checked for accuracy and are being reviewed regularly as well as updated immediately when necessary		Educator	
		1	2	3	4
		Not sure	Poor	Fair	Good
Comply to legal requirements with regards to copyright laws & company policies	Evidence that the package has been checked for legal compliance by the existence of a clear copyright statement in the beginning *(introduction),* identifying the owner of the program and the source of material to be used. All quoted material is correctly cited. Permission to use copyrighted material are obtained and displayed on program.	The e-learning program complies with copyright laws		Manager	
		1	2	3	4
		Not sure	Poor	Fair	Good

Project team with clear strategy	Physical evidence of a strategy (records) and project team responsible for certain actions. Documents with roles and responsibilities of project team.	There is an e-learning strategy and a project team whose roles and responsibilities are known and documented.		Manager	
		1	2	3	4
		Not sure	Poor	Fair	Good
Communication structure	The strategy indicates steps to be taken for dissemination of information, the structure for communication is well established and stakeholders knows how to use it	A communication structure and a plan for dissemination of information is clearly set out and are/have been followed		Manager	
		1	2	3	4
		Not sure	Poor	Fair	Good
Identifying time to learn	Records of a decision made that specific time will be set aside for learning purposes	The learners are allowed to follow the e-learning program during working hours and the managers/supervisor is aware of it.		Manager	
		1	2	3	4
		Not sure	Poor	Fair	Good

The steps followed if program has been self developed is correct	Records or a paper trail indicating that a process flow for program development has been followed. The order of the steps in the process follows a logical sequence. Essential steps have not been ignored.	In the development of the program a clear process has been followed namely the bandwidth has been determined, a needs analysis done, content determined, rapid prototyping and storyboarding took place. A production pathway was built, the usability of the program tested. Quality assurance and testing were done.		Manager	
		1	2	3	4
		Not sure	Poor	Fair	Good
Instructions on practical ways of working online	In the beginning *(introduction)* of the program (introduction) there is guidelines on participating in online discussions, how to use e-mail (netiquette) how to manage his time, how to deal with technical problems, how to manage his place of work and study, requirements on group work and how to form groups as well as the grading criteria for group work and their responsibilities as group members.	The program contains specific suggestion given to the learner with regards to netiquette, managing my time, technical problems, the place of work and study and his group work responsibilities.		Educator	
		1	2	3	4
		Not sure	Poor	Fair	Good

Evidence of quality	Evidence of wide range of access to the program and feedback about the program by various specialists in the field. Communication and networking opportunities linking a wide range of learners and specialists that enhances the learning process with evidence of such communication taking place. Evidence of consistency - all sites/learners receives the exact same material.	Various subject matter specialists have access to the program, increasing the contact amongst specialists in the particular field thus enhancing benchmarking and networking to maintain standards of training		Educator	
		1	2	3	4
		Not sure	Poor	Fair	Good
Must be efficient	There is no wastage of resources (technological, human and time) or learner time. All available computers are occupied, all human resources are available and occupied with the program management, all learners are busy all the time during the allowed learning time period.	When the program is used no computers are unattended (not being used) and there is no time wasted due to technology problems, people (learner resources) not available or when available not occupied with the program or other work.		Educator	
		1	2	3	4
		Not sure	Poor	Fair	Good

Must have Educationist satisfaction	Evidence of feedback received from Educationist on there satisfaction with the program (discussion forum, questionnaire or other means).	The program succeeds in creating the right environment for learning to take place		Educator	
		1	2	3	4
		Not sure	Poor	Fair	Good
Must have learner satisfaction	The learners voice there overall satisfaction with the program	A learner survey has been done to determine the learner's satisfaction with the program		Manager	
		1	2	3	4
		Not sure	Poor	Fair	Good
Plan to evaluate the success of the e-learning event	Physical evidence of a list of standards that if complied with, it will be indicative of success of the program. Evidence of a specific method chosen to measure performance against the standards.	Specific standards and method to evaluate performance against these standards have been set up to evaluate technical efficiency, user friendliness and educational value.		Manager	
		1	2	3	4
		Not sure	Poor	Fair	Good

Ensure enough support personnel for SME(subject matter expertise) as well as technological needs	Evidence of the existence of an appropriate team of support personnel (names known) consisting of all or some of the following people:-instructional technologist, educationist, media designer, programmer, network specialist and sponsor should be in place. The developers and reviewers of the course with their biographies, subject matter expertise and contact numbers are listed in the beginning (introduction) of the course.	There is a support team with contact numbers available should anyone need assistance.		Manager	
		1	2	3	4
		Not sure	Poor	Fair	Good
Performance reviews and rewards for good progress and success	Evidence of progress of learners being tracked and rewarded as per established policy	Learners' progress is reviewed intermittently and rewards are given for good progress.		Manager	
		1	2	3	4
		Not sure	Poor	Fair	Good
Organisational consulting, implementation and integration	Existing technological infrastructure are used. The program is part of existing training requirements of the organisation as proven per document or training matrix or there is a program map in the beginning *(introduction)* of the package linking it to other courses and credit values where applicable given.	The program is an integral part of an existing training delivery system.		Manager	
		1	2	3	4
		Not sure	Poor	Fair	Good

Must have reach	There is only one course addressing a particular topic. The course is available to all employees irrespective of geographical position (intranet or network delivery). A program map for the whole organisation to the course indicating reach - one for all.	The same course are used all over the organisation		Manager	
		1	2	3	4
		Not sure	Poor	Fair	Good
Cultural support for self-study.	Visible evidence of procedures, policies or communication in support of learning.	I am positive towards self studying and my colleagues and managers believe and support it as a good thing.		Learner	
		1	2	3	4
		Not sure	Poor	Fair	Good
Behavioural change measurement and reporting.	Physical evidence of a return on investment study. Evidence of workplace competence declaration. (Guglielmino &Associates, 2004; School of Pharmacy and Health Professions, 2004, Meyer *et al.*, 2003).	The training improves the employees' job performance and thus the company's performance improves.		Manager	
		1	2	3	4
		Not sure	Poor	Fair	Good

APPENDIX G

CONSENT LETTER AND ATTENDANCE REGISTER OF FOCUS GROUP PARTICIPANTS

Title of Meeting: _____ Date of Meeting _____

Chair Person: _____

NAME	COMPANY / DEPT	TELEPHONE	E-MAIL ADDRESS	SIGNATURE
D.J. VAN STADEN	GTAS CIRCUIT	610 - 4931	DanielvanStaden@sasol.com	
F. TESNIER	GAS CIRCUIT	610 5095	frikkie.tesnier@sasol.com	
P.W. VERMEULEN	WATER & ASH, UTIL.	610 - 5123	pieter.vermeulen1@sasol.com	
B.W. HENNETIC	REFINING	610 3330	[illegible]	
D. Hamblin	SHERQ Hackney	016 9680	[illegible]	
[illegible]	SHERQ Hackney	610 3466	[illegible]	

Linette Rautenbach's request for participation in an e-readiness research focus group.

Date	13/10/05
Name and Surname	DANIE VAN STADEN
Job description	TRAINING OFFICER
Business unit	GAS CIRCUIT TOSI
Organisation	TOSI
Years of experience in training field	13
Experience or use of e-learning for own development or for facilitation purposes	**Yes** ✓ **No** FACILITATION
Description of e-learning experience. (own or otherwise)	

I DANIE VAN STADEN (name) herewith give my consent that the discussions of which I am part today 13/10/05 (date) will be used as part of the research findings of Linette Rautenbach's electronic media use in the workplace research project (registered at the University of the Northwest) I understand that the discussions will be recorded for later reference by the researcher and her examiners only (Linette Rautenbach)

The researcher undertakes not to disclose any information shared by participants during the focus group besides referring to it in the aggregate No individual opinions will be shared with anyone except the members of the group in the presence of the whole group No opinions of individuals present will be shared with the organization or any of its members without referring to it in the aggregate

As participant I also undertake not to share any individual opinions that may have a negative influence about anyone present in this focus group with anyone, without the explicit consent of that particular individual I also undertake not to use any of the content of the research shared with me today without the explicit consent of the copyright holder namely Linette Rautenbach ID 5811300049082

Signature:.....

Date: 13/10/05.....

Linette Rautenbach's request for participation in an e-readiness research focus group.

Date	13. 10. 2005.	
Name and Surname	PIETER W. VERWEIJEN	
Job description	TRAINING OFFICER	
Business unit	WATER & ASH	
Organisation	SASOL SYNFUELS	
Years of experience in training field	13 YEARS	
Experience or use of e-learning for own development or for facilitation purposes	**Yes**	**No** X
Description of e-learning experience. (own or otherwise)	*KNOW - HOW	

I P.W. VERWEIJEN (name) herewith give my consent that the discussions of which I am part today 13. 10 05 (date) will be used as part of the research findings of Linette Rautenbach's electronic media use in the workplace research project (registered at the University of the Northwest) I understand that the discussions will be recorded for later reference by the researcher and her examiners only (Linette Rautenbach)

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As participant I also undertake not to share any individual opinions that may have a negative influence about anyone present in this focus group with anyone, without the explicit consent of that particular individual. I also undertake not to use any of the content of the research shared with me today without the explicit consent of the copyright holder namely Linette Rautenbach ID 5811300049082

Signature:.....

Date:.....13. 10 2005.....

Linette Rautenbach's request for participation in an e-readiness research focus group.

Date	13/10/2005	
Name and Surname	FRIKKIE TESNER	
Job description	SUR TRAINING OFFICER	
Business unit	GAS CIRCUIT	
Organisation	TDCI	
Years of experience in training field	3 YEARS	
Experience or use of e-learning for own development or for facilitation purposes	**Yes** ✓	**No**
Description of e-learning experience. (own or otherwise)	FACILITATION INTERNET SKILLWISE KNOW HOW ETM	

I FRIKKIE TESNER (name) herewith give my consent that the discussions of which I am part today 13/10/2005 (date) will be used as part of the research findings of Linette Rautenbach's electronic media use in the workplace research project (registered at the University of the Northwest) I understand that the discussions will be recorded for later reference by the researcher and her examiners only (Linette Rautenbach)

The researcher undertakes not to disclose any information shared by participant/s during the focus group besides referring to it in the aggregate. No individual opinions will be shared with anyone except the members of the group in the presence of the whole group. No opinions of individuals present will be shared with the organization or any of its members without referring to it in the aggregate.

As participant I also undertake not to share any individual opinions that may have a negative influence about anyone present in this focus group with anyone, without the explicit consent of that particular individual. I also undertake not to use any of the content of the research shared with me today without the explicit consent of the copyright holder namely Linette Rautenbach ID 5811300049082

Signature:.....

Date:13/10/2005.....

Linette Rautenbach's request for participation in an e-readiness research focus group.

Date	13 October 2005
Name and Surname	Dorothea Theresa Hall
Job description	Principal Human Resources Officer
Business unit	Skills Development
Organisation	Sasol Synfuels
Years of experience in training field	24
Experience or use of e-learning for own development or for facilitation purposes	**Yes** [ ] **No** [X]
Description of e-learning experience. (own or otherwise)	I can state that my experience is actually limited but I do have experience with presentations to people I have used electronic media

I Dorothea Theresa Hall (name) herewith give my consent that the discussions of which I am part today 13 October 2005 (date) will be used as part of the research findings of Linette Rautenbach's electronic media use in the workplace research project (registered at the University of the Northwest) I understand that the discussions will be recorded for later reference by the researcher and her examiners only (Linette Rautenbach)

The researcher undertakes not to disclose any information shared by participant/s during the focus group besides referring to it in the aggregate No individual opinions will be shared with anyone except the members of the group in the presence of the whole group No opinions of individuals present will be shared with the organization or any of its members without referring to it in the aggregate.

As participant I also undertake not to share any individual opinions that may have a negative influence about anyone present in this focus group with anyone, without the explicit consent of that particular individual. I also undertake not to use any of the content of the research shared with me today without the explicit consent of the copyright holder namely Linette Rautenbach ID 5811300049082

Signature:.....

Date: 13/10/2005

Linette Rautenbach's request for participation in an e-readiness research focus group.

Date	13 Oct 2005			
Name and Surname	Anton Heyneke			
Job description	GL : TRN			
Business unit	Refining			
Organisation	Sasol Synfuels			
Years of experience in training field	15 years			
Experience or use of e-learning for own development or for facilitation purposes	**Yes**		**No**	X
Description of e-learning experience. (own or otherwise)	None			

I A.W. Heyneke (name) herewith give my consent that the discussions of which I am part today 13 Oct 05 (date) will be used as part of the research findings of Linette Rautenbach's electronic media use in the workplace research project (registered at the University of the Northwest). I understand that the discussions will be recorded for later reference by the researcher and her examiners only (Linette Rautenbach).

The researcher undertakes not to disclose any information shared by participant/s during the focus group besides referring to it in the aggregate. No individual opinions will be shared with anyone except the members of the group in the presence of the whole group. No opinions of individuals present will be shared with the organization or any of its members without referring to it in the aggregate.

As participant I also undertake not to share any individual opinions that may have a negative influence about anyone present in this focus group with anyone, without the explicit consent of that particular individual. I also undertake not to use any of the content of the research shared with me today without the explicit consent of the copyright holder namely Linette Rautenbach ID 5811300049082.

Signature: .....

Date: 13. 10. 05

APPENDIX H

PHASE FOUR: VERIFIED AUDIT TOOL

Audit Tool for E-learning readiness in a workplace (organisation, business etc.)

TOTALS:

HUMAN DIMENSION :

TECHNOLOY DIMENSION :

PEDAGOGICAL DIMENSION :

ORGANISATIONAL DIMENSION :

Grand total and percentage audit instrument only:

The Human resource Dimension						
1. Standard	**The employee must have the necessary cognitive skills for E-learning (thinking abilities).**					
Scenario allowed:						
Desktop at workstation	Yes		No			
Media Centre	Yes		No			
Evidence required:	Evidence: The **introduction** of the course **specifies the attributes the employee** *needs* to complete the course namely, must be able to reason and solve problems, have conceptual thinking abilities, able to make meaning out of newly constructed knowledge, able to reflect, analyse, able to learn (knows how to learn). Each employee's **cognitive ability** has been determined **through testing**. Auditor's action: observe introduction of online course – ask for documents proving employees have been tested.					
Compliance:						
Specification of attributes needed for the course	1		0			
In the introduction	1		0			
A cognitive test (online) with related training if needed	1		0			
No training – must have alternative course options e.g. Class room training						
	1		0		Total	

Comments:				
Audit time-When can this element be evaluated?				
Before the course during the development stage	Yes		No	
During the course	Yes		No	
After the course	Yes		No	
The Human resource Dimension				
2. Standard	**The employee must be mentally ready for the E-learning course (psychologically ready).**			
Scenario allowed:				
Desktop at workstation	Yes		No	
Media Centre	Yes		No	
Evidence required:	Evidence: Specific **efforts** (meetings, communication, interviews, questionnaires, pre training) have been made by management or educationist to **mentally prepare** the employees for the course, make **enquiries** about any questions they might have and **address** all their **fears**. (N/A Audited results of questions paper) – Communication. Auditors action – ask how did they address fears. Obtain documented evidence of meetings, communication, interviews, questionnaires, and pre training sessions held.			
Compliance:				

Information on e-learning course provided	1		0			
Interviews/meetings/questionnaires held to gather concerns	1		0			
Concerns addressed	1		0		Total	
Comments:						
Audit time	When can this element be evaluated?					
Before the course during the development stage	Yes		No			
During the course	Yes		No			
After the course	Yes		No			
The Human resource Dimension						
3. Standard	**The employee must have the necessary computer skills to operate the computer and the learning course (technical ability).**					
Scenario allowed:						
Desktop at workstation	Yes		No			
Media Centre	Yes		No			

Evidence required:	Evidence: In the **beginning** (introduction) specific **computer skills requirements needed** to complete the course are **listed** (ability to retrieve information, use assessment tools, communicate through e-mail, use chat rooms, bill boards etc., create text and graphic documents, know referencing techniques). The **skills are tested** by way of an instrument or questions. Extra **online training is available** immediately where necessary – published documents. Auditor's action: observe introduction of online course for the evidence of list, test and online training.					
Compliance:						
Computer skills requirements are listed	1		0			
In the introduction/beginning	1		0			
Skills are tested online	1		0		Total	
Online training is available immediately	1		0			
Comments:						
Audit time	When can this element be evaluated?					
Before the course during the development stage	Yes		No			
During the course	Yes		No			
After the course	Yes		No			

The Human resource Dimension								
4. Standard	**The employee must possess the correct E-learning behaviours (attitudes, believe system).**							
Scenario allowed:								
Desktop at workstation	Yes		No					
Media Centre	Yes		No					
Evidence required:	Evidence: The **introduction** (beginning) of the course **specifies the attributes (e-learning behaviours)** the employee needs to learn online namely, self directedness, work independently as well as in collaboration with others, participation, open minded, able to learn in various ways and a positive attitude – attributes are published. Online **Links** to web site self tests or own designed tests are provided to help the employees **determine whether online learning is appropriate** for them like the Guglielmino self directed learning readiness test and or the Learning preference assessment. (Guglielmino & Associates, 2004; School of pharmacy and health professions, 2004).							
Compliance:								
The E-learning behaviours needed is specified	1		0					
In the introduction/beginning	1		0					
Test is done to determine E-learning appropriateness.	1		0		Total			
Comments:								
Audit time	When can this element be evaluated?							
Before the course during the development	Yes		No					

stage					
During the course	Yes		No		
After the course	Yes		No		
The Human resource Dimension					
5. Standard	**The Educator must be mentally ready for E-learning.**				
Scenario allowed:					
Desktop at workstation	Yes		No		
Media Centre	Yes		No		
Evidence required:	Evidence: Specific **efforts** (meetings, communication, interviews, questionnaires, pre training) have been made by management to **mentally prepare** the educator for the course, make **enquiries** about any questions they might have and **address** all their **fears**. (N/A Audited results of questions paper) – Communication. Auditors action – ask how did they address fears. Obtain documented evidence of meetings, communication, interviews, questionnaires, and pre training sessions held.				
Compliance:					
Information on e-learning course provided to educators.	1		0		

Interviews/meetings/questionnaires held to gather concerns	1		0			
Concerns addressed	1		0		Total	
Comments:						
Audit time	When can this element be evaluated?					
Before the course during the development stage	Yes		No			
During the course	Yes		No			
After the course	Yes		No			
The Human resource Dimension						
6. Standard	**The Educator must have the necessary skills and a positive attitude towards E-learning.**					
Scenario allowed:						
Desktop at workstation	Yes		No			
Media Centre	Yes		No			
Evidence required:	Evidence: Must have **proof of training as an e-learning facilitator** *(certificate* etc.) He **demonstrates** ability to perform his own **course administration** duties. He can demonstrate **online mediation** with employees (dialogue). He can **verbalise** his **role** as **tutor** (one on one) **mediator** (create climate for dialogue, encourage independent learner action, act as resource and co learner) – documented proof of training, demonstrates technical competence. Auditor's action: Ask facilitator for proof of training and to show/demonstrate admin skills and dialogue. Ask does					

	his roll entail.					
Compliance:						
Trained as E-learning facilitator	1		0			
Does own course administration online	1		0			
Demonstrate online mediation	1		0		Total	
Verbalise his one to one tutor mediator role	1		0			
Comments:						
Audit time	**When can this element be evaluated?**					
Before the course during the development stage	Yes		No			
During the course	Yes		No			
After the course	Yes		No			
The Human resource Dimension						
7. Standard	**Plan for dissemination of information on the e-learning course**					
Scenario allowed:						
Desktop at workstation	Yes		No			
Media Centre	Yes		No			

Evidence required:	Evidence: There are specific **plan** for the dissemination of information. Employees are **involved** in the planning phase and are consulted on how to market the benefits of the course, how to obtain buy in and how to communicate information. There are **employee representative** on the **planning committees**. **Minutes** indicate **input from** employees was obtained. - Documented strategy for dissemination of information and attendance lists indicating the presence of the employees. Auditor's action: inspect minutes and attendance list of meetings.					
Compliance:						
A plan for the dissemination of information exists	1		0			
There is a planning committee with employee representatives	1		0			
Documented evidence of employee inputs	1		0		Total	
Comments:						
Audit time	When can this element be evaluated?					
Before the course during the development stage	Yes		No			
During the course	Yes		No			
After the course	Yes		No			

The Human resource Dimension						
8. Standard	**Allow time for people to change/adapt.**					
Scenario allowed:						
Desktop at workstation	Yes		No			
Media Centre	Yes		No			
Evidence required:	Evidence: Time for a **trial run** exposing the **entire** employee training **target group** to the easier parts of the course is allowed. The employee can test it for simplicity and determine to what extent it is consistent with his own needs. The employee is under **no obligation** to continue using it and can opt not to follow the e-learning course, but rather do a face to face training session – a trail run exists and are used. Auditor's action: Ask for proof of the trial run and check the exposed target group.					
Compliance:						
Trial run exists	1		0			
Employees tested it with no obligation	1		0			
Face to face training still an option	1		0		Total	
Comments:						
Audit time	When can this element be evaluated?					
Before the course during the development stage	Yes		No			
During the course	Yes		No			

After the course	Yes		No			
The Human resource Dimension						
9. Standard	**Safe working environment during the trial period**					
Scenario allowed:						
Desktop at workstation	Yes		No			
Media Centre	Yes		No			
Evidence required:	Evidence: Employees were/are comfortable that they were/are given enough **privacy**/room to try the course as it has been **communicated** to them. The **tracking abilities** *of the course have been* cancelled during the roll out stages or **no responses/feedback** was given to employees allowing them complete privacy – documented communication. Auditor's action: Inspect administration capabilities of course. Ask educator. Did they track employees during the trial period and provided feedback?					
Compliance:						
Privacy communicated during trial run (documented)	1		0			
Tracking abilities cancelled	1		0			
No feedback given	1		0		Total	
Comments:						
Audit time	When can this element be evaluated?					
Before the course during the	Yes		No			

development stage						
During the course	Yes		No			
After the course	Yes		No			
The Human resource Dimension						
10. Standard	**Have the necessary subject matter pre knowledge or entry level requirements**					
Scenario allowed:						
Desktop at workstation	Yes		No			
Media Centre	Yes		No			
Evidence required:	Employees have the **necessary pre knowledge to follow the course stated** clearly in the beginning ***(introduction)*** of the course. There must be *statements on prior knowledge requirements* i.e. must have a specific qualification or knowledge with or without a *test instrument* to test knowledge readiness. Auditor's action: observe introduction of online course.					
Compliance:						
Pre knowledge requirements stated clearly	1		0			
In the introduction	1		0			
					Total	
Comments:						

Audit time	When can this element be evaluated?					
Before the course during the development stage	Yes		No			
During the course	Yes		No			
After the course	Yes		No			
The Human resource Dimension						
11. Standard	Human Resources and IT administration training					
Scenario allowed:						
Desktop at workstation	Yes		No			
Media Centre	Yes		No			
Evidence required:	Administrators and Educators have been trained to use the administrative tools of the course. Evidence of *training sessions and attendance lists*. Auditor's action: Ask for attendance list					
Compliance:						
Attendance of training sessions exists	1		0			
					Total	

Comments:					
Audit time	**When can this element be evaluated?**				
Before the course during the development stage	Yes		No		
During the course	Yes		No		
After the course	Yes		No		

The Technology Dimension					
1. Standard	**The E-learning material should appeal to both hemispheres of the brain (engaging).**				
Scenario allowed:					
Desktop at workstation	Yes		No		
Media Centre	Yes		No		
Evidence required:	Evidence: There are online **attractive visual presentations**, **auditory stimulation** and **kinesthetic stimulation** and engage the employee by **eliciting participation** in the learning event – online course. Auditor's action: Ask to show - Inspection of online course – look for all three plus how does it enlist participation.				
Compliance:					
Attractive visual presentation	1		0		
Auditory stimulation	1		0		

Kinesthetic stimulation	1		0		Total	
Comments:						
Audit time-When can this element be evaluated?						
Before the course during the development stage	Yes		No			
During the course	Yes		No			
After the course	Yes		No			
The Technology Dimension						
2. Standard	**Aesthetically adds value.**					
Scenario allowed:						
Desktop at workstation	Yes		No			
Media Centre	Yes		No			
Evidence required:	Evidence: Appealing format:- **Colour**, **letter** type, page **length**, **headings**, **margins**, **contrast**, **positioning** of graphics, **clarity**, **alignment**, attractiveness, **frames**. **Numbers** clearly indicate sequence in tasks or processes. **Bullets** are used where prioritisation by numbers are not needed. Bullets, numbers and dashes are used **consistently** throughout the course. **Bold face** is used **sparingly** and **only** where **important material** have to be highlighted. **Capital letters** and underlining are **not** used to **emphasize**. **Headings and subheadings** are used to organise content consistently. **Keywords** are highlighted. Pages are **uncluttered** and leave space. Justification used to rectify ragged right margins. Contrast between the text and						

	background makes reading text easy. All **graphics**, **tables**, **photos** further clarify the content - is **linked** to the content. Illustrations are clear. **JPEG** files are used to accommodate download speeds. **Graphics** *are* **textually explained** and text is aligned with graphics. If frames are used it must be used consistently throughout. Consistent use of all abovementioned requirements. Auditor's action: Inspection of online course.				
Compliance:	Subjective judgment of evaluator				
Colour	1		0		
Letter type	1		0		
Page length	1		0		
Headings	1		0		
Margins	1		0		
Contrast	1		0		
Positioning of graphics	1		0		
Clarity	1		0		
Bold Face used correctly	1		0		
Keywords highlighted	1		0		
Clutter	1		0		
Graphics add value	1		0		
JPEG or GIF format	1		0		
Graphics text line to explain	1		0		

Frames	1		0			
Numbers	1		0			
Bullets	1		0			
Consistency	1		0			
Alignment	1		0			
	1		0		Total	
Comments:						
Audit time-When can this element be evaluated?						
Before the course during the development stage	Yes		No			
During the course	Yes		No			
After the course	Yes		No			
The Technology Dimension						
3. Standard	**The technological infrastructure must be able to support the course without interference of the existing load**					
Scenario allowed:						
Desktop at workstation	Yes		No			
Media Centre	Yes		No			
Evidence required:	Evidence: Depending on the type of delivery system used the technological infrastructure **complies** with the **listed**/documented **technical back end** requirements, **network** requirements, **learning management system**					

	requirements as well as the **receiving end** of training (**desktop** requirements) for the e-learning course. – ask for documented technical requirements and proof of compliance (The network, technical back end and desktop requirements are clearly defined - known, listed in introduction or in strategy. A list of technical requirements for end user computers appear in the beginning (introduction) of the course. (I.e. modem speed, internet bandwidth, hardware requirements).					
Compliance:						
Technical back end requirements known and complies	1		0			
Receiving end requirements known and complies	1		0			
Network requirements known and complies	1		0			
Learning management system requirements known and complies	1		0		Total	
Comments:						
Audit time-When can this element be evaluated?						
Before the course during the development stage	Yes		No			
During the course	Yes		No			
After the course	Yes		No			

The Technology Dimension							
4. Standard	**Help line for technical support**						
Scenario allowed:							
Desktop at workstation	Yes		No				
Media Centre	Yes		No				
Evidence required:	Evidence: A **technical support help line** and or **links to technical support** information are visible and available and working and displayed in the **introduction** - **someone** that can help on the other side is **available** immediately. The **time** during which the technical support is available is **stated** clearly – inspect online course and test the helpline. Auditor's action: Inspection of online course						
Compliance:							
Technical support line posted online	1		0				
Available on each page (navigation button)	1		0				
Time during which help is available is stated	1		0				
Immediate help available when line is tested	1		0		Total		
Comments:							
Audit time-When can this element be evaluated?							

Before the course during the development stage	Yes		No		
During the course	Yes		No		
After the course	Yes		No		
The Technology Dimension					
5. Standard	**Graphics used must not disturb download times.**				
Scenario allowed:					
Desktop at workstation	Yes		No		
Media Centre	Yes		No		

Evidence required:	Evidence: **No interference** in **download time** and **accessibility** and **use** of the course pages and or graphics. A **test** has been done to determine the **number** of **employees** that can easily be managed by the server and existing infrastructure – test online course and ask for test to determine how many can log in undisturbed at one time. Auditor's action: Inspection of online course. Ask for technical data. Ask for test results.					
Compliance:						
Download time of graphics acceptable	1		0			
Opening of new pages acceptable	1		0			
The load allowable is known (number of computers per network specified – known)	1		0		Total	
Comments:						
Audit time-When can this element be evaluated?						
Before the course during the development stage	Yes		No			
During the course	Yes		No			
After the course	Yes		No			
The Technology Dimension						

6. Standard	Have printable version option					
Scenario allowed:						
Desktop at workstation	Yes		No			
Media Centre	Yes		No			
Evidence required:	Evidence: There is an **operable printing option available** and **displayed** in the pages of the course and it is **linked** to a **printer in the immediate vicinity** for collection – inspect course and test printing option. Auditor's action: Inspection of online course					
Compliance:						
Printing option is available	1		0			
Printing option is clearly displayed	1		0			
It is operable	1		0			
Printed material available in immediate vicinity	1		0		Total	
Comments:						
Audit time-When can this element be evaluated?						
Before the course during the development stage	Yes		No			
During the course	Yes		No			
After the course	Yes		No			

The Technology Dimension						
7. Standard	**Course has an easy access address**					
Scenario allowed:						
Desktop at workstation	Yes		No			
Media Centre	Yes		No			
Evidence required:	Evidence: There are no complicated or time consuming access procedures. The **course is immediately accessible** after loading or clicking on the address/desktop icon. No navigation through various pages necessary. Auditor's action: Inspection of online course access..					
Compliance:						
Access available within 3 clicks	1		0			
					Total	
Comments:						
Audit time-When can this element be evaluated?						
Before the course during the development stage	Yes		No			
During the course	Yes		No			
After the course	Yes		No			

The Technology Dimension						
8. Standard	**Hyperlinks clearly indicate where they will lead.**					
Scenario allowed:						
Desktop at workstation	Yes		No			
Media Centre	Yes		No			
Evidence required:	Evidence: **Hyperlinks** clearly indicate where they will **lead** and **size of download files** is present. Links to other parts within the course or external sources are **operating** and **correct**. Auditor's action: Inspection of online course – spot check test links					
Compliance:						
All links indicate where they lead	1		0			
Size of downloadable files are indicated	1		0			
All links work properly - lead to new page (active)	1		0			
The link leads to the information as indicated (correctly linked	1		0			
					Total	

Comments:					
Audit time-When can this element be evaluated?					
Before the course during the development stage	Yes		No		
During the course	Yes		No		
After the course	Yes		No		

	The Technology Dimension				
1. Standard	The course is technically simple to use.				
Scenario allowed:					
Desktop at workstation	Yes		No		
Media Centre	Yes		No		

Evidence required:	Evidence: The course **easily operable** by making use of a **point and click system.** **Navigation bars** are used *consistently* (**look** and **open up** in the **same manner**) throughout the course. **Each** page/or screen frame or interface page contains the following **links**: - a link to the **next** and **previous page**, to **start** of the **module**, **beginning** of the **course**, **e-mail or other collaboration options**, and **other parts** of the course. Page **headers** *or* **footers** indicate **where** the employee is in the course. Auditor's action: Inspection of online course.				
Compliance:					
Easy operable using point and click system	1		0		
Navigation bars look the **same** and **open** up in the **same** manner. Each page/frame has the following links:	1		0		
Next and **previous** page	1		0		
To the **beginning/start** of the **module**	1		0		
To the **beginning** of the **course**	1		0		
To **collaboration** options – e-mail or other.	1		0		
To index or **other parts** of the **course**	1		0		

Header or **footer** indicating where you are/**position in course**/progress line etc.	1		0			
					Total	
Comments:						
Audit time-When can this element be evaluated?						
Before the course during the development stage	Yes		No			
During the course	Yes		No			
After the course	Yes		No			
The Technology Dimension						
2. Standard	**The course must have centralised tracking and administration**					
Scenario allowed:						
Desktop at workstation	Yes		No			
Media Centre	Yes		No			

Evidence required:	Evidence: Possess an **administrative tool** enabling employee **assessments**, **reports**, **progress tracking**, and **employee satisfaction evaluation** tools Auditor's action: Inspection of online course – back en administrative tool.						
Compliance:							
Online employee satisfaction evaluation possible	1		0				
Online assessment possible	1		0				
Progress tracking	1		0				
Reports facility	1		0		Total		
Comments:							
Audit time-When can this element be evaluated?							
Before the course during the development stage	Yes		No				
During the course	Yes		No				
After the course	Yes		No				

The Technology Dimension							
3. Standard	**Easy access to information once the course has been accessed.**						
Scenario allowed:							
Desktop at workstation	Yes		No				
Media Centre	Yes		No				
Evidence required:	**Evidence: Information is easily found due to a <u>detailed table of contents</u> and <u>site map</u> in the <u>beginning</u> (introduction) of the course. Both the site map and content <u>contains hyperlinks</u> taking the employee to a particular point immediately just by clicking on it.** **Auditor's action: Inspection of online course – check detail of table of content, site map and hyperlinks.**						
Compliance:							
Detailed table of contents exist in the beginning of the course	1		0				
Linked to content as indicated	1		0				
Site map exist in beginning of course	1		0				
Linked to specific area in course as indicated	1		0		Total		
Comments:							

Audit time-When can this element be evaluated?					
Before the course during the development stage	Yes		No		
During the course	Yes		No		
After the course	Yes		No		
The Technology Dimension					
4. Standard	**Use the appropriate e-learning delivery system.**				
Scenario allowed:					
Desktop at workstation	Yes		No		
Media Centre	Yes		No		
Evidence required:	**The particular delivery system should be chosen in accordance with their ability to support the cognitive and social processes associated with learning. Delivery systems are classified according to their cognitive relevant capabilities and their attributes. The attributes include technology (physical, mechanical, electronic capabilities i.e. television) processing capabilities (information receivable, - display, - storage, - organisation, - translation, - transformation, - evaluation) and symbol systems (spoken language, printed text, pictures, numerals, maps, graphs). Decisions on which feedback and interactivity systems are to be used (synchronous or asynchronous) to best support the learning process.**				

Compliance:						
Attractive visual presentation	1		0			
Auditory stimulation (sound)	1		0			
Kinesthetic stimulation (movement)	1		0			
Collaboration capabilities exist	1		0			
Is it best choice of delivery	1		0		Total	
Comments:						
Audit time-When can this element be evaluated?						
Before the course during the development stage	Yes		No			
During the course	Yes		No			
After the course	Yes		No			

TOTAL Technology dimension:

The Pedagogical Dimension: (The epistemological assumptions of knowledge construction is supportive of the Constructivist Philosophy on knowledge construction and incorporates the characteristics of the Constructivist view of meaningful learning namely engaging activity, generated knowledge, collaborative, conversational, intentional, complex and reflective.)						
1. **Standard**	**Appropriate interaction typology for collaboration and conversation**					
Scenario allowed:						
Desktop at workstation	Yes		No			
Media Centre	Yes		No			
Evidence required:	Evidence: A **variety of typologies** are used to encourage conversation (synchronous and asynchronous).The various types of interaction typologies (synchronous or asynchronous) **each** take place in its **own virtual space**. Despite group communication **individual communication** from employee to facilitator is still **possible** – inspect course. Auditor's action: Ask to show typologies used. Check if each are in own virtual space. Determine if individual communication is still possible.					
Compliance:						
Synchronous typology	1		0			
Asynchronous typology	1		0			
Each in own virtual space	1		0			
Private individual communication	1		0			
					Total	
Comments:						
Audit time-When can this element be evaluated?						

Before the course during the development stage	Yes		No		
During the course	Yes		No		
After the course	Yes		No		
THE PEDAGOGICAL DIMENSION					
2. Standard	**Humanise the class/learning group**				
Scenario allowed:					
Desktop at workstation	Yes		No		
Media Centre	Yes		No		
Evidence required:	Evidence: The course design provides **opportunities** to **converse** with other employees on an **informal level**. Evidence of a **space** where employees are **introduced** to each other and **share information about themselves**. Auditor's action: Inspection of online course – ask where informal conversation is allowed. Ask for space for participant introductions.				
Compliance:					
Informal conversation allowed	1		0		
Space for introduction of employees	1		0		
				Total	
Comments:					

Audit time-When can this element be evaluated?					
Before the course during the development stage	Yes		No		
During the course	Yes		No		
After the course	Yes		No		
THE PEDAGOGICAL DIMENSION					
3. Standard	**Appropriate educational activities**				
Scenario allowed:					
Desktop at workstation	Yes		No		
Media Centre	Yes		No		

Evidence required:	Evidence: Five types of activities or combinations thereof, namely **motivational** (activities eliciting the employee's internal interest), **orientation activities** (orient employee to where he has been, where he is now and where he is going), **information activities** (to understand new ideas or information) **reinforcing or application activities** (to practice what they have learned in i.e. discussions, collaborative work, projects & exercises) and **evaluation activities** (reflective -explain how they came to conclusions, what strategies were used, what were their thought processes and how well they have mastered the outcomes) exists. The activities are **sequenced logically right through** the course – inspect online course. Auditor's actions: Ask to show examples of the five types of activities and how has it been arranged through the course.					
Compliance:						
Motivational activities	1		0			
Orientation activities	1		0			
Information activities	1		0			
Application activities	1		0			
Reflective/evaluation activities	1		0			
Logically sequenced	1		0			
					Total	
Comments:						

Audit time-When can this element be evaluated?					
Before the course during the development stage	Yes		No		
During the course	Yes		No		
After the course	Yes		No		
THE PEDAGOGICAL DIMENSION					
4. Standard	**Goal orientation must unfocused to support inductive learning.**				
Scenario allowed:					
Desktop at workstation	Yes		No		
Media Centre	Yes		No		
Evidence required:	Evidence: A **set** of **outcomes/goals/objectives** for the course are **listed** in the **beginning** of the **course** and **each module** has its own objectives set out in the beginning of the modules. Each outcome follow a **logical sensible sequence** of events and are **clear** and **measurable** – inspect the course goals and module goals. Auditor's action: - ask to show goals – determine position, logical arrangement, clarity and measurability.				
Compliance:					
Outcomes are listed	1		0		
In the beginning of course	1		0		
In the beginning of each module	1		0		

Logical sequence	1		0		
Measurable	1		0		Total
Comments:					
Audit time-When can this element be evaluated?					
Before the course during the development stage	Yes		No		
During the course	Yes		No		
After the course	Yes		No		
THE PEDAGOGICAL DIMENSION					
5. Standard	**The problems presented must be complex and authentic, and possess experiential validity that is concrete not abstract**				
Scenario allowed:					
Desktop at workstation	Yes		No		
Media Centre	Yes		No		
Evidence required:	Evidence: The activities required from the employee must include **problem presentations** that are **complex** (not over simplified), reflecting the ill structured ness of the real work environment. It must stimulate higher order thinking. The problems must be **authentic** namely reflecting the challenges and affordances of the **real work situations**. Auditor's action: Inspection of online course – spot-check activities.				

Compliance:						
Complex problem presentations	1		0			
Authentic	1		0			
					Total	
Comments:						
Audit time-When can this element be evaluated?						
Before the course during the development stage	Yes		No			
During the course	Yes		No			
After the course	Yes		No			
THE PEDAGOGICAL DIMENSION						
6. Standard	**Provide for any possible/foreseen resources**					
Scenario allowed:						
Desktop at workstation	Yes		No			
Media Centre	Yes		No			
Evidence required:	Evidence:					

	• In the **beginning** *(introduction)* of the course there is a **list** containing a **variety** of **required** (compulsory) and **recommended** (optional) resources with **instructions** on **how** to use it and **where** to find it. Resources are **accessible**, **appropriate** and **accurate** (current and related to the course). • There is enough **variety** in the resources to provide for the **differences** in **interests**, **ability** and **learning styles** of the employees. • Resources with **different point** of **views** are used when appropriate. Clear **indications** of resources **inclusive** of and **beyond** the **course** material to be used at different points of the course where it is needed.) • There is also a **frequently** asked **questions** page to address the most questions asked, an **index list** with key **words/glossary** with explanations thereof and a **reference list** including a variety of material used includes books, articles, web sites etc at the **end** of the course. Auditor's action: Inspection of online course.				
Compliance:					
A variety of resources (list)	1		0		
Resources reflect different points of view	1		0		
Inclusive of and beyond content	1		0		
Accommodates different learning styles	1		0		
In the beginning of course	1		0		
Resources differentiate between compulsory & recommended	1		0		
Instructions on how to use	1		0		
Instructions on where to find it	1		0		

Resources are accurate	1		0			
Resources are accessible	1		0			
Resources are appropriate	1		0			
FAQ	1		0			
Glossary	1		0			
References at the end of course	1		0		Total	
Comments:						
Audit time-When can this element be evaluated?						
Before the course during the development stage	Yes		No			
During the course	Yes		No			
After the course	Yes		No			
THE PEDAGOGICAL DIMENSION						
7. Standard	**Make use of instructional processes designed for knowledge construction**					
Scenario allowed:						
Desktop at workstation	Yes		No			
Media Centre	Yes		No			

Evidence required:	Evidence: **The reinforcement activities** must make use of either **modeling** and/or **scaffolding** cognitive tools and/or hints or **coaching** was used. Auditor's action: Inspection of online course. Ask for examples of all three – spot-check.					
Compliance:						
All activities use	1		0			
Modeling	1		0			
Scaffolding tool	1		0			
Hints or coaching	1		0			
					Total	
Comments:						
Audit time-When can this element be evaluated?						
Before the course during the development stage	Yes		No			
During the course	Yes		No			
After the course	Yes		No			
THE PEDAGOGICAL DIMENSION						
8. Standard	**Cultural sensitivity**					

Scenario allowed:						
Desktop at workstation	Yes		No			
Media Centre	Yes		No			
Evidence required:	Evidence: The diversity amongst employees is respected by content not being biased in any way with regards to age, culture, ethnicity, race, gender, sexual preference. The course has **been tested for cultural sensitivity** by a **diverse team representing** the diversity amongst the **organisations employees** – **documented proof** of efforts to ensure cultural sensitivity and any **offensive content** have been **removed**. Auditor's action: Ask for documented proof of testing content for cultural sensitivity – inspect course for any deviations.					
Compliance:						
Proof of test for cultural sensitivity	1		0			
Team represents diversity amongst employees	1		0			
No offensive content	1		0		Total	
Comments:						
Audit time-When can this element be evaluated?						
Before the course during the development stage	Yes		No			
During the course	Yes		No			
After the course	Yes		No			

THE PEDAGOGICAL DIMENSION					
9. Standard	**E-learning must comply with the principles of adult learning**				
Scenario allowed:					
Desktop at workstation	Yes		No		
Media Centre	Yes		No		
Evidence required:	Evidence: • The adult employee (is self directed) **controls** his own learning by managing his **own** online **time**, freedom of **navigation** opportunities, choosing his own **activities**. The course shows that the employees follow different routes, choose different activities and use the time spent on different areas of the course varies between individuals. • Some of the activities allow (ask) the employee to **relate, link, refer to his own experiences. All** activities relates to the employee's job in the sense that it is contextualised – it **reflects the real job** environment. • The course relates to the employees job and **completing** it will enable him to do his **job better (empower)** and thus better his chances of **career advancement** opportunities because the course is a pre requisite for a better position. • The employee is **linked** to an **audience of other employees** so that he can compete and **collaborate** whilst working **online**. The course provides **forums** for discussions/presentation of **work** etc. online. All the employees are **linked** to these forums. Auditor's action: Inspection of online course for discussions amongst employee on course content. Ask educator for required training matrix indicating the need for the employee to attend the course.				
Compliance:					
Employees may follow different routes	1		0		
May choose own activities	1		0		

May use own time	1		0		
Activities allow for relating to own experiences	1		0		
All activities reflect real job situation	1		0		
Training requirement indicates course as part of a specific job position	1		0		
Competing possible through online collaboration	1		0		
					Total
Comments:					
Audit time-When can this element be evaluated?					
Before the course during the development stage	Yes		No		
During the course	Yes		No		
After the course	Yes		No		
THE PEDAGOGICAL DIMENSION					
10. Standard	**The physical learning environment must be conducive to learning**				

Scenario allowed:						
Desktop at workstation	Yes		No			
Media Centre	Yes		No			
Evidence required:	**Evidence: The physical learning environment is <u>conducive</u> to learning, <u>no disruptions, noise, visual disturbances, ergonomics, and temperature</u>.** **Auditor's action: Inspection of physical learning environment.**					
Compliance:						
No disruptions possible	1		0			
Noise	1		0			
Visual disturbances	1		0			
Ergonomics	1		0			
Temperature	1		0			
					Total	
Comments:						
Audit time-When can this element be evaluated?						
Before the course during the development stage	Yes		No			
During the course	Yes		No			

After the course	Yes		No		
THE PEDAGOGICAL DIMENSION					
11. Standard	**The course relate to the character of the subject and the users.**				
Scenario allowed:					
Desktop at workstation	Yes		No		
Media Centre	Yes		No		
Evidence required:	Evidence: • The **content** is **sensibly and consistently divided** in **knowledge domains/modules** – the course. • **Each module** consistently follows the **same sequence** i.e. introduction, content, end, test. • **Each module** starts with a **preview**. • The **table** of **content** provides a clear indication of how the **material is arranged.** • **The core** required course **content** is clearly **separated** from **supplementary material** if any. • The content (modules) follows a **logical sequence** in **content** and **difficulty**. Auditor's action: Inspection of online course				
Compliance:					
Content divided in knowledge domains	1		0		
Division is sensible and consistent	1		0		
Each module follows the same sequence	1		0		
Each starts with a preview	1		0		

Module table of content clarifies material arrangement	1		0			
Core separated from supplementary content	1		0			
Module sequencing logical in accordance with knowledge building and difficulty	1		0			
					Total	
Comments:						
Audit time-When can this element be evaluated?						
Before the course during the development stage	Yes		No			
During the course	Yes		No			
After the course	Yes		No			
THE PEDAGOGICAL DIMENSION						
12. Standard	**The course is modifiable thus flexible**					
Scenario allowed:						
Desktop at workstation	Yes		No			

Media Centre	Yes		No			
Evidence required:	Evidence: The educators can **immediately** or in a **short period** change/**modify** the course (without the need to make use of external resources) to provide for creativity or changed needs of employees – activity or evidence of previous changes. Auditor's action: Inspection of online course – ask educator/facilitator					
Compliance:						
Course can be modified within short period	1		0			
					Total	
Comments:						
Audit time-When can this element be evaluated?						
Before the course during the development stage	Yes		No			
During the course	Yes		No			
After the course	Yes		No			
THE PEDAGOGICAL DIMENSION						
13. Standard	**Identify the correct employee population group**					
Scenario allowed:						

Desktop at workstation	Yes		No			
Media Centre	Yes		No			
Evidence required:	**Evidence: An online <u>list,</u> clearly stating employee <u>pre requisites</u> or <u>co requisites</u> for the course, are listed in the <u>beginning</u> *(introduction)* of the course – published document.** **Auditor's action: Inspection of online course.**					
Compliance:						
An online list describing the target group exists	1		0			
Pre requisites and co requisites (if any) are described	1		0			
The list is in the beginning of course	1		0			
					Total	
Comments:						
Audit time-When can this element be evaluated?						
Before the course during the development stage	Yes		No			
During the course	Yes		No			
After the course	Yes		No			

THE PEDAGOGICAL DIMENSION					
14. Standard	**Appropriate allocation of time and resources to activities (i.e. online discussions, online peer review, assignments, group work, games, assessment).**				
Scenario allowed:					
Desktop at workstation	Yes		No		
Media Centre	Yes		No		
Evidence required:	Evidence: The **online** educational activities chosen allocate specific **people**, **material**, **time** and **technical support** to be used for the activity. **Each** activity has clear **step by step instructions** for clarity of the employee/employee. The **number** of online activities and **time** provided to complete them is **reasonable**. Auditor's action: Inspection of online course – ask for exercise where it has been tested/pilot. Ask if employee finish on time. Are there any complaints regarding time allowed.				
Compliance:					
Online activities has clear step by step instructions	1		0		
Human resources for activity listed	1		0		
Material needed for activity listed	1		0		
Technical support for activity listed	1		0		
Number of online activities reasonable	1		0		

Time allowed per activity reasonable					Total	
Comments:						
Audit time-When can this element be evaluated?						
Before the course during the development stage	Yes		No			
During the course	Yes		No			
After the course	Yes		No			

THE PEDAGOGICAL DIMENSION					
15. Standard	**Extra attention should be given to the employees' reading, writing skills and language abilities.**				
Scenario allowed:					
Desktop at workstation	Yes		No		
Media Centre	Yes		No		
Evidence required:	Evidence: • The employees **reading, typing and language skills were tested** in the **same language** that the course is written and a **score to qualify** for the course are given in the beginning of the course – a test. • The course accommodates/provides extra **support** to those who is studying in their **second** or third **language** – extra **online** support. • The level of **language** application is **appropriate** to the educational **level** of the target group. • The design **accommodates colour-blindness**, pages can **zoom** in/**enlarge**, and **sound** is also replaced with text for those who cannot hear. Auditor's action: Inspection of online course – look for options for different colour schemes or avoidance of use of primary colours.				
Compliance:					
Online language ability test exists	1		0		
Online typing test exist	1		0		
Test done in same language than the course	1		0		

Tests done before or in the beginning of course	1		0			
Criteria to qualify for course indicated	1		0			
Extra online support for translation purposes	1		0			
Language application suits educational level of employee	1		0			
Accommodates colour blindness - visual disabilities	1		0			
Pages can enlarge (Zoom) – visual disabilities	1		0			
Text is replaced with sound - deafness	1		0			
					Total	
Comments:						
Audit time-When can this element be evaluated?						
Before the course during the development stage	Yes		No			
During the course	Yes		No			

After the course	Yes		No		
THE PEDAGOGICAL DIMENSION					
16. Standard	**Formative assessment during the process of learning**				
Scenario allowed:					
Desktop at workstation	Yes		No		
Media Centre	Yes		No		
Evidence required:	Evidence: • The course does not only use summative assessment but also makes use of **formative assessment** focused on **strategies** to **construct** new knowledge (portfolio work or other types of assessments). • **Assessment and grading procedures** are clearly described and explicit (clearly understood). It includes clear indication on assignment submission **format** and **dates**, information on the **percentage allocation to** work. • The educator can provide evidence of **matching** the **evaluation tools** with the **assessment criteria** of each outcome (criteria mapping). • **All** assessment exercises are **placed in context** of the employee's careers/job profiles of the employee. Auditor's action: Inspection of online course assessment tools. Ask for evidence of criteria mapping, formative assessment.				
Compliance:					
Formative assessments exist	1		0		
Assessment requires new knowledge building	1		0		

Assessment procedure is clearly described	1		0			
Grading process clearly explained	1		0			
Assignment submission format described	1		0			
Assignment submission date indicated	1		0			
Percentage allocation to work is indicated	1		0			
Evaluations tool matches the requirements of the assessment criteria.	1		0			
Assessments are contextualized to the specific work or job situation	1		0			
					Total	
Comments:						
Audit time-When can this element be evaluated?						
Before the course during the development stage	Yes		No			

During the course	Yes		No		
After the course	Yes		No		
THE PEDAGOGICAL DIMENSION					
17. Standard	**Appropriate match between size of virtual group and educational strategies**				
Scenario allowed:					
Desktop at workstation	Yes		No		
Media Centre	Yes		No		
Evidence required:	Evidence: The number of Educators/facilitators can **manage all employees** needs with ease **within the prescribed timeframe** (synchronously or asynchronous). There are **no late responses** to e-mail or **feedback** on work submitted. Auditor's action: Ask if responses are in time - Inspection of online course dates and time questions come in and date and time of response. Do the same with feedback.				
Compliance:					
All feedback to employees within required timeframe	1		0		
				Total	
Comments:					

Audit time-When can this element be evaluated?					
Before the course during the development stage	Yes		No		
During the course	Yes		No		
After the course	Yes		No		

TOTAL Pedagogical dimensions:

The Organisational Dimension:					
1. Standard	**Necessary contact numbers on the front/home page**				
Scenario allowed:					
Desktop at workstation	Yes		No		
Media Centre	Yes		No		
Evidence required:	Evidence: A summary of the **core activities** and **contact** details of the **business department** that is the owner of the course's details are clearly displayed on the front/**beginning** *(introduction)* of the course. Casual visitors to the training site can see who it belongs and can link it to the bigger organisational structure. Auditor's action: Inspection of online course.				
Compliance:					
Front page displays the business	1		0		

unit name						
Core activities is listed	1		0			
Contact details are listed	1		0			
Organogram link to bigger organisation	1		0			
					Total	
Comments:						
Audit time-When can this element be evaluated?						
Before the course during the development stage	Yes		No			
During the course	Yes		No			
After the course	Yes		No			
THE ORGANISATIONAL DIMENSION						
2. Standard	**Effective security measures to ensure credibility**					
Scenario allowed:						
Desktop at workstation	Yes		No			
Media Centre	Yes		No			
Evidence required:	Evidence: • In the **beginning** (introduction) of the course there is **published** information on **regulations regarding** and					

	consequences in breech of **virus** protection, **plagiarism**, correct use of **copyrighted** material and **authenticity of work submitted** used. • The course has **access control**. Employees have to register with passwords. **Measures** are in place to **ensure credibility** of work submitted. • Course material can not be **altered/copied** without access control and access to **secure areas is controlled** (i.e. test banks, work already submitted). Auditor's action: Inspection of online course – check if it can be altered, copied. Ask to show measures to ensure credibility. Check access of secure areas				
Compliance:					
Online instructions in beginning of course on	1		0		
Regulations on virus protection	1		0		
Plagiarism	1		0		
Use of copyrighted material	1		0		
Authenticity of work submitted	1		0		
Access through registration and password	1		0		
Measures to ensure credibility of assessments (observed assessments, fingerprinting, security questions, varying assessments)	1		0		

Access control to secure areas e.g. assessment banks, course alteration abilities.	1		0			
					Total	
Comments:						
Audit time-When can this element be evaluated?						
Before the course during the development stage	Yes		No			
During the course	Yes		No			
After the course	Yes		No			
THE ORGANISATIONAL DIMENSION						
3. Standard	**Published privacy policy**					
Scenario allowed:						
Desktop at workstation	Yes		No			
Media Centre	Yes		No			

Evidence required:	Evidence: There is a **privacy policy in the beginning** *(introduction)* of the course describing the employee's **right to privacy** and the **conditions** under which their names and online submissions may be **shared** with others. Auditor's action: Inspection of online course					
Compliance:						
Privacy policy exists in beginning of course	1		0			
State employee's right to privacy	1		0			
State conditions under which information will be shared	1		0			
					Total	
Comments:						
Audit time-When can this element be evaluated?						
Before the course during the development stage	Yes		No			
During the course	Yes		No			
After the course	Yes		No			

THE ORGANISATIONAL DIMENSION						
4. Standard	**Feedback regulations stipulated.**					
Scenario allowed:						
Desktop at workstation	Yes		No			
Media Centre	Yes		No			
Evidence required:	Evidence: A set of **feedback and response time guidelines/policy,** indicating the response time after employee requests or work entered for assessment, is visible in the **introduction** course. Auditor's action: Inspection of online course					
Compliance:						
Feedback guidelines exist in introduction/beginning	1		0			
Stipulate response time on E-mail	1		0			
Stipulate response time after work submitted	1		0			
					Total	
Comments:						

Audit time-When can this element be evaluated?					
Before the course during the development stage	Yes		No		
During the course	Yes		No		
After the course	Yes		No		
THE ORGANISATIONAL DIMENSION					
5. Standard	**Branded educational content**				
Scenario allowed:					
Desktop at workstation	Yes		No		
Media Centre	Yes		No		
Evidence required:	Evidence: • There are at least **annual review dates** or other methods used to keep content current and accurate. **Reviews** have been **done** as per scheduled dates. (Team of experts or a published continual improvement process) – Document to this effect. • The course has been **edited** for grammar, spelling, and language. **Spelling** is correct. **Verbs** are in **active** voice not passive voice i.e. the teacher poured the coffee not the coffee was poured by the teacher. Grammar is simple and accurate. **Sentences** are **short**. **Paragraphs** **brief** and **to the point**. **No mistakes** can be found – documents. • Content has been **checked** and it meets all outcomes of the course. Relevant and complete to **address all outcomes** (criteria map exists) - Document. • **Content checked** for **accuracy** by more than 1 subject matter experts and **signed off** as correct – document. Auditor's action: Ask which SME's checked content, signed off as correct. Inspection of online course for review dates or				

	policy on review. Check for grammar & spelling - Evidence of editing. Evidence of criteria map exists – educationist can show that content addresses each outcome an assessment criteria.						
Compliance:							
Published online review schedule.	1		0				
Online regulations/policy for reviews exist	1		0				
Review team published online	1		0				
Review date in line with schedule	1		0				
Documented evidence of editing (on or offline)	1		0				
Spelling correct	1		0				
Verb use in active voice	1		0				
Sentences short and to the point	1		0				
Paragraphs brief and to the point	1		0				
Content checked by at least 2 SME's and signed off as correct.	1		0				
Content matches all outcomes and assessment criteria (criteria map)	1		0				
					Total		
Comments:							

Audit time-When can this element be evaluated?					
Before the course during the development stage	Yes		No		
During the course	Yes		No		
After the course	Yes		No		
THE ORGANISATIONAL DIMENSION					
6. Standard	**Comply with legal requirements with regards to copyright laws & company policies**				
Scenario allowed:					
Desktop at workstation	Yes		No		
Media Centre	Yes		No		
Evidence required:	Evidence: The package has been checked for legal compliance by the existence of a **clear copyright statement** in the **beginning** *(introduction)*, identifying the owner of the course and the **use of other sources properly referenced** (consent to use copyrighted material where necessary) – published copyright statement and references. Auditor's action: Inspection of online course				

Compliance:						
Copyright statement exists in introduction/beginning	1		0			
Referenced material properly referenced	1		0			
Consent for copyrighted material available (online)	1		0			
					Total	
Comments:						
Audit time-When can this element be evaluated?						
Before the course during the development stage	Yes		No			
During the course	Yes		No			
After the course	Yes		No			
THE ORGANISATIONAL DIMENSION						
7. Standard	**Project team with clear strategy**					
Scenario allowed:						
Desktop at workstation	Yes		No			

Media Centre	Yes		No			
Evidence required:	Evidence: Physical evidence of a **strategy** (records) and **project team responsible** for certain actions during the development and implementation phase of e-learning – records and team members names and responsibilities. Auditor's action: Ask for strategy project plan - inspection of records.					
Compliance:						
A Project team exists	1		0			
A strategy as per project plan exists (documented/online)	1		0			
Team members roles and responsibilities allocated	1		0		Total	
Comments:						
Audit time-When can this element be evaluated?						
Before the course during the development stage	Yes		No			
During the course	Yes		No			
After the course	Yes		No			
THE ORGANISATIONAL DIMENSION						
8. Standard	**Identifying time to learn.**					

Scenario allowed:						
Desktop at workstation	Yes		No			
Media Centre	Yes		No			
Evidence required:	Evidence: **Records** of official instruction regarding **online working time** that will be set aside for e-learning purposes. **Courses** in media centre have a **time allocated** to them and specific time arrangements are made for **desktop online training** – documents. Auditor's action: Inspection of online course/management decision or policy on time to be used for online desktop e-learning					
Compliance:						
Documented evidence of management support/permission consenting to the e-learning course	1		0			
Documented evidence of amount of people allowed at a time online	1		0			
					Total	
Comments:						
Audit time-When can this element be evaluated?						
Before the course during the development stage	Yes		No			
During the course	Yes		No			

After the course	Yes		No		
THE ORGANISATIONAL DIMENSION					
9. Standard	**The steps followed if course has been self developed is correct. If course is purchased only evaluate needs analysis and technical requirements (ignore first 2)**				
Scenario allowed:					
Desktop at workstation	Yes		No		
Media Centre	Yes		No		
Evidence required:	Evidence: Records or a paper trail indicating a **process flow** for **course development** has been followed. The **order of the steps** in the process follows a logical sequence. **Essential steps** have not been ignored (Needs analysis, determine bandwidth, determine content, rapid prototype testing, build course, Quality assurance and testing) - *documents*. Auditor's action: Inspection of development process. Evidence of each step can be presented.				
Compliance:					
Record of process flow of development	1		0		
Logical sequence of process flow	1		0		
Essential steps not ignored. (technical requirement & needs analysis)	1		0		
					Total

Comments:					
Audit time-When can this element be evaluated?					
Before the course during the development stage	Yes		No		
During the course	Yes		No		
After the course	Yes		No		
THE ORGANISATIONAL DIMENSION					
10. Standard	**Instructions on practical ways of working online**				
Scenario allowed:					
Desktop at workstation	Yes		No		
Media Centre	Yes		No		
Evidence required:	Evidence: In the beginning (**introduction**) of the course there is **online guidelines** *(published guidelines)* for participation (compulsory or not, date & time, who will participate, how to etc.) in **online discussions/collaborative work**. Clear **indications** are given on **which particular individual/s is to participate** in collaborative activities (communication flow). **Instructions** are given on **when to use which** typology (synchronous or asynchronous). **Expectations** and **responsibilities** regarding collaborative activities are described. In the beginning (**introduction**) of the course there is **online guidelines** on how to use e-mail (netiquette) – *published guidelines*.				

	Auditor's action: Ask if discussion forums are used - Inspection of online course for synchronous and asynchronous activity.					
Compliance:						
Online guidelines for collaborative work exists in the introduction	1		0			
It specifies date & time for collaborative work	1		0			
It specifies who is to participate	1		0			
It specifies which typology to use (synchronous or asynchronous)	1		0			
Expectations and responsibilities are described	1		0			
Online guidelines on netiquette exists	1		0		Total	
Comments:						
Audit time-When can this element be evaluated?						
Before the course during the development stage	Yes		No			
During the course	Yes		No			
After the course	Yes		No			

THE ORGANISATIONAL DIMENSION					
11. Standard	**Evidence of quality (consistency of course content and wide contact).**				
Scenario allowed:					
Desktop at workstation	Yes		No		
Media Centre	Yes		No		
Evidence required:	Evidence: • There is evidence of **wide range of online access to** the course and **feedback about** the course **by the various specialists** (SME - subject matter expert on content) in the field. • Online **Communication opportunities linking** a wide range of **employees** and **specialists** that **enhances the learning** process with evidence of such **communication taking place** – *collaboration on course*. Auditor's action: Ask and test for access, ask for feedback - Inspection of online course/evidence of input during development – *observe and documents*. Inspection of online course communication between employees and specialists.				

Compliance:						
SME's have online access to course	1		0			
Feedback on course exists	1		0			
Communication opportunities with SME's, other employees (besides learner group and facilitator) exist	1		0			
Online evidence of such communication exist	1		0		Total	
Comments:						
Audit time-When can this element be evaluated?						
Before the course during the development stage	Yes		No			
During the course	Yes		No			
After the course	Yes		No			

THE ORGANISATIONAL DIMENSION					
12. Standard	**Must be efficient**				
Scenario allowed:					
Desktop at workstation	Yes		No		
Media Centre	Yes		No		
Evidence required:	Evidence: There is **no wastage of resources** (technological, human (employees and support team) and time) – *scheduling versus available computers.* Depending on where the e-learning is done (media centre or employees desktop) all available computers are occupied all the time during the periods that the course is running or used. **Technology resources.** Auditor's action: Inspection of training area/room, booking schedules and number of computers. **Time as resource:** Evidence: All **human resources** (support personnel only) allocated to the course are **available and fully occupied** during the hours required to work, either full time course management or partial course and other work (i.e. subject matter expert needs not be fully occupied - he can continue his own work and assist when needed). There is also no shortage of needed personnel – *answer on question to Manager.* Auditor's action: Ask about the number of support personnel involved and time required versus time spent on the event. Evidence: All **employees** are **busy all the time** during the learning time period allowed – *answer on question to manager.* Auditor's action: Ask – what happens when the employees finish sooner or needs more time.				
Compliance:					

All computers are occupied (media centre or desktop) – fully booked and attended.	1		0			
Time spent on course facilitation meets expectations no shortage of staff or too much staff.	1		0			
Employee's time spent on course meets expectations – able to complete within timeframe, no wastage of time or need for more time	1		0			
					Total	
Comments:						
Audit time-When can this element be evaluated?						
Before the course during the development stage	Yes		No			
During the course	Yes		No			
After the course	Yes		No			

THE ORGANISATIONAL DIMENSION						
13. Standard	**Must have Educationist satisfaction**					
Scenario allowed:						
Desktop at workstation	Yes		No			
Media Centre	Yes		No			
Evidence required:	Evidence: **Feedback** received from **Educationist** on there **satisfaction** with the course (discussion forum, questionnaire or other means) – *document.* Auditor's action: Ask to show – any documents pertaining (a survey/exercise/activity/communication) to measure/determine the overall satisfaction of the educationist/s with the ability of the course to create the right learning environment (educational value of course).					
Compliance:						
Surveys done to measure educationist satisfaction with course	1		0			
Result indicate positive outcome	1		0			
					Total	
Comments:						

Audit time-When can this element be evaluated?					
Before the course during the development stage	Yes		No		
During the course	Yes		No		
After the course	Yes		No		
THE ORGANISATIONAL DIMENSION					
14. Standard	**Must have employee satisfaction**				
Scenario allowed:					
Desktop at workstation	Yes		No		
Media Centre	Yes		No		
Evidence required:	Evidence: **Feedback** received from **Educationist** on there **satisfaction** with the course (discussion forum, questionnaire or other means) – *document.* Auditor's action: Ask to show – any documents pertaining (a survey/exercise/activity/communication) to measure/determine the overall satisfaction of the educationist/s with the ability of the course to create the right learning environment (educational value of course).				

Compliance:						
Surveys done to measure employees satisfaction with course	1		0			
Result indicate positive outcome	1		0			
					Total	
Comments:						
Audit time-When can this element be evaluated?						
Before the course during the development stage	Yes		No			
During the course	Yes		No			
After the course	Yes		No			
THE ORGANISATIONAL DIMENSION						
15. Standard	**Plan to evaluate the success of the e-learning event.**					
Scenario allowed:						
Desktop at workstation	Yes		No			
Media Centre	Yes		No			
Evidence required:	Evidence: Physical evidence of a **list of standards/goals/definition of victory** (excluding employee and educationist					

	feedback. Includes **technical efficiency, educational value added and user friendliness**) that if complied with/reached, it will be indicative of success of the course. Evidence of standard/s and a **tool** chosen to measure success – *document*. Auditor's action: Ask to show standard/s **and** tool to evaluate compliance with (Survey, interviews, message analysis, employee participation etc. Look for document/results online or otherwise).					
Compliance:						
Technical efficiency goals are defined (documented)	1		0			
Educational efficiency goals are defined	1		0			
User friendliness goals defined	1		0			
Tool to measure each exists	1		0			
Success of the event has been determined	1		0		Total	
Comments:						
Audit time-When can this element be evaluated?						
Before the course during the development stage	Yes		No			
During the course	Yes		No			
After the course	Yes		No			

THE ORGANISATIONAL DIMENSION					
16. Standard	**Ensure enough support personnel from SME (subject matter experts) as well as technological needs.**				
Scenario allowed:					
Desktop at workstation	Yes		No		
Media Centre	Yes		No		
Evidence required:	Evidence: The existence of an **appropriate team of support personnel** (names known) consisting of all or some of the following people:-instructional technologist, educationist, media designer, course manager, network specialist and sponsor should be in place. The developers and reviewers of the course with their **biographies**, subject matter expertise and **contact numbers** are listed in the beginning (introduction) of the course. This information must be in **immediate** reach of user – documented. Auditor's action: Ask to show - Inspection of online course or immediate availability of support team information.				
Compliance:					
Support team names published online i.e. Klaas de Haas – electrical engineer – 345 7654	1		0		
In Introduction/beginning	1		0		
Information includes biographies of each	1		0		
Information includes field of expertise	1		0		
Contact numbers of each	1		0		

The team is available when phoned	1		0			
Minimum team members namely technology expert, educator/facilitator and subject matter expert.	1		0			
					Total	
Comments:						
Audit time-When can this element be evaluated?						
Before the course during the development stage	Yes		No			
During the course	Yes		No			
After the course	Yes		No			
THE ORGANISATIONAL DIMENSION						
17. Standard	**Performance reviews and rewards for good progress and success**					
Scenario allowed:						
Desktop at workstation	Yes		No			
Media Centre	Yes		No			
Evidence required:	Evidence: Evidence of progress of **employees being tracked and rewarded as per established policy** (it could be incentives, certification, recognition or rewards) – *documents*.					

	Auditor's action: Ask to show - Inspection of recognition & reward policies particularly in relation to employee progress and real examples of rewards given.					
Compliance:						
Reward system exists (document)	1		0			
Employees are tracked – documented system	1		0		Total	
Comments:						
Audit time-When can this element be evaluated?						
Before the course during the development stage	Yes		No			
During the course	Yes		No			
After the course	Yes		No			
THE ORGANISATIONAL DIMENSION						
18. Standard	**Organisational consulting, implementation and integration**					
Scenario allowed:						
Desktop at workstation	Yes		No			
Media Centre	Yes		No			

Evidence required:	The course is **part and parcel of existing training requirements** (career path) of the organisation (widely accepted) as proven per document **or training matrix**. There is a course **map** in the beginning *(introduction)* of the package linking it to other courses and credit values where applicable given. Auditor's action: Inspection of online course.					
Compliance:						
Integrated into training requirements as per training matrix	1		0			
Course map indicates link to other courses	1		0		Total	
Comments:						
Audit time-When can this element be evaluated?						
Before the course during the development stage	Yes		No			
During the course	Yes		No			
After the course	Yes		No			
THE ORGANISATIONAL DIMENSION						
19. Standard	**Must have reach. (Same everywhere).**					
Scenario allowed:						

Desktop at workstation	Yes		No			
Media Centre	Yes		No			
Evidence required:	Evidence: There is only **one course addressing a particular topic** for **all employees in a particular field** or job category. The course is **available to all** employees irrespective of geographical position (intranet, network delivery or other means). A course map for the whole organisation to the course indicating reach - one for all – *computer access.* Auditor's action: Ask to show - Inspection of online courses or course map or organisational access (intranet).					
Compliance:						
One course per topic	1		0			
Available to all (whole organisation)	1		0		Total	
Comments:						
Audit time-When can this element be evaluated?						
Before the course during the development stage	Yes		No			
During the course	Yes		No			
After the course	Yes		No			
THE ORGANISATIONAL DIMENSION						
20. Standard	**Cultural support for self-study by making use of e-learning**					

Scenario allowed:						
Desktop at workstation	Yes		No			
Media Centre	Yes		No			
Evidence required:	Evidence: Visible evidence of **organisational procedures, policies or communication** in support of e-learning – *documents.* **Auditor's action: Ask to show - Inspection of documents.**					
Compliance:						
Organisational Training policy in support of Educationist-learning	1		0			
					Total	
Comments:						

Audit time-When can this element be evaluated?					
Before the course during the development stage	Yes		No		
During the course	Yes		No		
After the course	Yes		No		
THE ORGANISATIONAL DIMENSION					
21. Standard	**Behavioural change measurement and reporting.**				
Scenario allowed:					
Desktop at workstation	Yes		No		
Media Centre	Yes		No		
Evidence required:	Evidence: Physical evidence of a **return on investment study** indicating that the course will have **positive financial benefits** – documents. Auditor's action: Ask to show - Inspection of ROI documents and management decisions based on ROI. Evidence: Evidence of **behavioural change measurement** through **course assessments** and **workplace competence declaration** – *documents.* Auditor's action: Ask to show - Inspection of course assessments and competence declarations or procedure for competence declaration related to the e-learning course's outcomes				

Compliance:						
ROI study present (document) with positive report	1		0			
Formative assessments exist	1		0			
Summative assessments exist	1		0			
Competency declaration on the job for course exist	1		0			
					Total	
Comments:						
Audit time-When can this element be evaluated?						
Before the course during the development stage	Yes		No			
During the course	Yes		No			
After the course	Yes		No			
TOTAL Organisational dimension:						

APPENDIX I

PHASE FOUR: LEARNER, FACILITATOR AND MANAGER QUESTIONNAIRE

Please complete the following computer learning research questionnaire (Employee)

Completing this questionnaire is **voluntary** and **anonymous**. The research results will only be published in the aggregate (combined in groups) as part of the outcome of this research project. By completing this questionnaire you consent to participating in this project as an anonymous participant. No identification is required. **Your participation will be greatly appreciated.**

Instructions Section A:-

- The questions apply only to the course you have just completed.
- Please mark the appropriate block next to each statement with the letter x between the brackets like this = (X)
- Choose one preference only.
- **Where indicated** more than one choice can be made.
- TOTAL questions:- 38 (excluding Section A biographical section)

SECTION A

Biographical information. (please complete the following questions about yourself – no identification is required)

1. Gender		**Male** ( )		Female ( )	
	18 – 30 years	**31 – 40 years**	**41 – 50 years**	51 – 65 years	
2. Age.	( )	( )	( )	( )	
3. Race	**African** ( )	**Coloured** ( )	**Indian** ( )	**White** ( )	Other (specify)
4. Please provide your highest educational qualification e.g. Grade 10, st 8, matric etc.					
5. Do you have a computer at home	**YES**		**NO**		
6. If you answered yes in question 5 complete the following also - Do you have **internet** access on this computer.	**YES**		**NO**		

7. What is the name of the course you completed TODAY

	Less than 2	**2 and more but less than 4 courses**	**4 and more but less than 6 courses**	More than 6 courses
8. How many times have you done a course presented through electronic learning (Computer learning) before.	( )	( )	( )	( )

	Media Centre	**Class room**	**In my office my own computer**	Other (specify)
9. Where did the last course you did took place	( )	( )	( )	

See next page

DO NOT COMPLETE THE NEXT QUESTION IF THIS WAS THE *FIRST TIME* YOU MADE USE OF COMPUTER LEARNING

10	What type of computer learning if any, did you use in the past *(Not the one you have just completed - YOU CAN CHOOSE MORE THAN ONE IF APPLICABLE).*	Purely online learning - **no face-to-face contact** with a facilitator (trainer) or other (employees)	( )
		Blended Learning - combination of **online learning and face-to-face contact** with the facilitator(trainer) and or other (employees) eg media centre	( )
		Same time learning: - A virtual classroom. An **instructor-led** online learning event, in which **all participants are logged on** to the computer network at the **same time and communicate directly with each other through** making use of the **computer** at hand.(synchronous)	( )
		Intermittent: - Learning in which online **communication** between the facilitator (trainer) and employees occurs **intermittently** with a **time delay**. Examples are self-paced courses taken via the Internet or CD-ROM, Question and answer mentoring, online discussion groups, and email.(asynchronous)	( )
		Instructor-led group: - there is an **instructor/trainer to facilitate** the learning process.	( )
		Self-study – text online: - no instructor, text on computer to read on your own	( )
		Web-based: - Delivery of educational content via a Web browser over the public Internet, a private intranet, or an extranet.	( )
		Computer-based (*CD-ROM*)	( )

		Video/audio tape	( )
		Self-study with subject matter expert to provide support	( )
		I DON'T KNOW – CANNOT CLASSIFY IT	( )

Instructions Section B:-

- In your opinion, rate the importance of each statement made in relation to **the course you have just completed in the media centre**.
- Make one choice only.
- The choices range from 1 to 4 where 1 represents that you strongly DISAGREE and 4 that you STRONGLY AGREE.
- In this context (the workplace) the employee means the employee/worker and the educator/facilitator refers to the person directly responsible for the training of the employee.

SECTION B

Code Office use	The requirements of the **Human Resource Dimension** (This dimension includes addressing the needs of employees as human beings with specific capabilities and applying them in the best possible way so that they can function optimally in their particular job position. It includes developing and training employees to fit specific job profiles and reach required job outputs. It also includes ensuring a positive work environment and climate to work in).	**Strongly disagree**	**Disagree**	**Agree**	Strongly agree
		1	**2**	**3**	**4**
A1	Before I started the course I have been tested (online or otherwise) to determine whether I possess the right **thinking** abilities for the course.	( )	( )	( )	( )
		1	**2**	**3**	**4**
A2	I was/am ready to start the course. All my *concerns/fears* about learning with a computer have been addressed.	( )	( )	( )	( )

		1	2	3	4
A3	The computer skills that I needed for the course were described online (on the computer) and tested online before I started the course.	( )	( )	( )	( )
		1	**2**	**3**	**4**
A4.1	I learn better and prefer to learn by active *participation with other learners* through *communicating* via E-mail, chat rooms, direct dialogue (phone, face to face communication).	( )	( )	( )	( )
		1	**2**	**3**	**4**
A4.2	I am good at taking content/knowledge apart, analyse it and put it together again making it meaningful for myself.	( )	( )	( )	( )
		1	**2**	**3**	**4**
A4.3	I know how to learn and make use of several learning methods.	( )	( )	( )	( )
		1	**2**	**3**	**4**
A4.4	I like learning on my own and can stick to a study plan.	( )	( )	( )	( )
		1	**2**	**3**	**4**
A4.5	I approach new learning experiences with an open mind with questioning, analysing, listening, writing and discussing things.	( )	( )	( )	( )
		1	**2**	**3**	**4**
A6.1	The personal attention (one to one assistance) that I received from the course facilitator (person directly responsible to support your **learning**) is satisfactory.	( )	( )	( )	( )

		Strongly disagree	Disagree	Agree	Strongly agree
		1	2	3	4
A8	I have been prepared for the course and was informed and am convinced of the benefits of computer learning.	( )	( )	( )	( )
		1	2	3	4
A9	I have been exposed to computer learning awareness sessions and computer learning trial sessions and feel I had enough time to get used to electronic learning.	( )	( )	( )	( )
		1	2	3	4
A10	I am comfortable that during the initial stages of my exposure to computer learning I was allowed enough privacy to test the course in order to get used to it.	( )	( )	( )	( )
		1	2	3	4
A11	Whether I possess the necessary pre knowledge or qualifications necessary to follow the course, have been determined/assessed in the beginning of the course.	( )	( )	( )	( )

	The requirements of the **Technology Dimension** (An ything related to hardware, software, connectivity, media, mode of delivery, technical support).	**Strongly disagree**	**Disagree**	**Agree**	Strongly agree
		1	**2**	**3**	**4**
B1	The computer course that I just did engaged me (raised my interest, involved me, kept my attention), by requiring my active participation AND interesting visual presentations AND sound projections AND moving objects (all four were present as part of the course) that appealed to me.	( )	( )	( )	( )
		1	**2**	**3**	**4**
B6	Accessing the computer course is easy and simple	( )	( )	( )	( )
		1	**2**	**3**	**4**
B7	The navigation buttons of the course were used in the exact same way and look the same right through the computer course.	( )	( )	( )	( )
		1	**2**	**3**	**4**
B8.1	The hyperlinks of the course clearly indicated where they will lead when clicked upon and it was working right through.	( )	( )	( )	( )

		Strongly disagree	Disagree	Agree	Strongly agree
		1	**2**	**3**	**4**
B8.2	Where there were options to download files the hyperlinks indicated the size (how big) of the files that I could download.	( )	( )	( )	( )
		1	**2**	**3**	4
B10	The computer course was technically simple to use and I could operate it with ease.	( )	( )	( )	( )
		1	**2**	**3**	**4**
B11	The computer course possessed the ability to assess me (test), give me feedback on my progress and allowed me to provide feedback on my satisfaction on the use thereof.	( )	( )	( )	( )
		1	**2**	**3**	**4**
B12	Finding information once I accessed the course was easy because there was a detailed table of contents (index) and a site map in the beginning *(introduction)* of the course.	( )	( )	( )	( )
		1	**2**	**3**	**4**
B13	The particular computer training delivery system chosen for the course was sufficient to support all my thinking and social needs necessary when learning.	( )	( )	( )	( )

	The requirements of the **Pedagogical Dimension** (Anything to do with the art, science or profession of teaching, the application of principles and methods of education, and ways of imparting knowledge, skills and growing desired attitudes and behaviours).	**Strongly disagree**	**Disagree**	**Agree**	Strongly agree
		1	**2**	**3**	**4**
C8	I found the computer course to be sensitive to my age, race, gender and culture and it did not offend my cultural values.	( )	( )	( )	( )
		1	**2**	**3**	**4**
C9	The computer course allowed me to work independently and control/direct my own learning event.	( )	( )	( )	( )
		1	**2**	**3**	**4**
C9.1	I was allowed to make use of/relate to my own work experiences during discussions and exercises provided as part of the computer course.	( )	( )	( )	( )

		Strongly disagree	Disagree	Agree	Strongly agree
		1	2	3	4
C9.2	The computer course fulfilled my need to be more efficient at work and supports my chances to obtain better job opportunities/position	( )	( )	( )	( )
		1	2	3	4
C9.3	The computer course provided ample online opportunity (e-mail, chat rooms etc.) to fulfill my need to collaborate and discuss the work with other employees.	( )	( )	( )	( )
		1	2	3	4
C10	The physical learning environment in which I had to follow the computer course is conducive to learning.	( )	( )	( )	( )
		1	2	3	4
C11	Online instruction on how to use my time while I was on the computer course had been given and the advice was useful.	( )	( )	( )	( )
		1	2	3	4
C13	The course allowed for different paths/routes one can follow through the course.	( )	( )	( )	( )
		1	2	3	4
C16	The course content was relevant and appropriate to my job and presented at the right moment in my career. The learning material has a connection with and is suitable to the work I do.	( )	( )	( )	( )

		1	2	3	4
C17	I consider this electronic learning experience to be an easier way of learning than my previous learning experiences e.g. classroom training, previous computer courses.	( )	( )	( )	( )
		1	**2**	**3**	**4**
C18.1	The computer course provided me with enough opportunity to make my own learning decisions (make notes when I want to, look for extra information when I want to, discuss it with others when I want to, differ from others or the course content when I want to).	( )	( )	( )	( )
		1	**2**	**3**	**4**
C18.2	I was allowed to work at my own pace within the constraints of the course time limits	( )	( )	( )	( )
		1	**2**	**3**	**4**
C19	I am comfortable with the course design. I know what was expected of me to do most of the time, and when I didn't know what to do, support from the course facilitator was readily available.	( )	( )	( )	( )
		1	**2**	**3**	**4**

		Strongly disagree	Disagree	Agree	Strongly agree
C20	I received relevant constructive timely feedback for all my requests (e.g. e-mail questions to facilitator or training officer etc) within the determined timeframe.	( )	( )	( )	( )
		1	2	3	4
C21	I was given enough time and resources and support to complete activities	( )	( )	( )	( )

Continue to next page please

	The requirements of the **Organisational Dimension** (This dimension includes any requirement that the employer has of the training activity to ensure that the organisation stays profitable and viable. It includes managerial activities to ensure that operations are running efficiently, the image as a company is maintained, the administration, policies, procedures, regulations, and guidelines are being adhered to).	**Strongly disagree**	**Disagree**	**Agree**	Strongly agree
		1	**2**	**3**	**4**
D22	I am positive towards self studying through electronic learning and my colleagues and managers believe and support it as a good thing.	( )	( )	( )	( )

Thank you for your support

Please add any comments underneath

Should you wish to make comments to the researcher in person please phone 082 416 9881

E-learning research questionnaire (Facilitator/Educator)

Completing this questionnaire is **voluntary** and **anonymous**. The results will only be published in the aggregate (combined in groups) as part of the outcome of this research project. By completing this questionnaire you consent to participating in the project as an anonymous participant. No identification is required. All responses where the participant is known to the researcher will be treated as confidential. Your participation is appreciated.

Definition of e-learning: - "E-learning (electronic learning): 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." (Learningcircuits, 2004).

Instructions Section A:-

- The questions apply only to courses you have facilitated in your current workplace hosted by your current employer.
- Please mark the appropriate block next to each statement with the letter x *between* the brackets like this = (X)
- Choose one preference only.
- Where indicated more than one choice can be made.
- TOTAL questions:- 22 (excluding Section A biographical section)

SECTION A

Biographical information. (please complete the following questions about yourself – no identification is required)

11 Gender	**Male**	Female
	( )	( )

	18 – 30 years	**31 – 40 years**	**41 – 50 years**	51 – 65 years
12 Age.	( )	( )	( )	( )

13 Race	**African**	**Coloured**	**Indian**	**White**	Other(specify)
	( )	( )	( )	( )	

14 What is the name of the most recent/current e-learning course/s you facilitate/d? (if you are facilitating one now – this course should be listed)

		Less than 2	**2 and more but less than 4 courses**	**4 and more but less than 6 courses**	More than 6 courses
15	How many times have you facilitated a course presented through electronic learning (Computer learning)?	( )	( )	( )	**( )**
16	Where did the last course you facilitated took place	**Media Centre** ( )	**Class room** ( )	**In employees office his/her own computer** ( )	Other (specify)
17	What type of e-learning did you facilitate thus far *(YOU CAN CHOOSE MORE THAN ONE IF APPLICABLE).*	Purely online learning - no face-to-face contact with a facilitator (trainer) or other (employees).			**( )**
		Blended Learning - combination of online learning and face-to-face contact with the facilitator(trainer) and or other (employees)			**( )**
		Synchronous: - A virtual classroom. An instructor-led online learning event, in which all participants are logged on to the computer network at the same time and communicate directly with each other through making use of the computer at hand.			**( )**

Asynchronous: - Learning in which online interaction between the facilitator (trainer) and employees occurs intermittently with a time delay. Examples are self-paced courses taken via the Internet or CD-ROM, Question and answer mentoring, online discussion groups, and email.	( )
Instructor-led group :- there is an instructor/trainer to facilitate the learning process	( )
Self-study – text online: - no instructor, text on computer to read on your own	( )
Web-based: - Delivery of educational content via a Web browser over the public Internet, a private intranet, or an extranet.	( )
Computer-based (*CD-ROM*)	( )
Video/audio tape	( )
Self-study with subject matter expert to provide support	( )

Instructions Section B:-

- In your opinion, rate the importance of each statement made in relation to your most recent e-learning facilitation experience with your current employer.
- Make one choice only.
- The choices range from 1 to 4 where 1 represents that you strongly DISAGREE and 4 that you STRONGLY AGREE.
- In this context (the workplace) the employee means the employee/worker and the educator/facilitator refers to the person directly responsible for e-learning facilitation.

SECTION B1

Code Office use	The requirements of the **Human Resource Dimension** (This dimension includes addressing the needs of employees as human beings with specific capabilities and applying them in the best possible way so that they can function optimally in their particular job position. It includes developing and training employees to fit specific job profiles and reach required job outputs. It also includes ensuring a positive work environment and climate to work in).	**Strongly disagree**	**Disagree**	**Agree**	Strongly agree
		1	**2**	**3**	**4**
A5	*I am ready to facilitate the course. All my concerns/fears about e-learning facilitation have been addressed.*	( )	( )	( )	( )

		1	2	3	4

A6.2	I have been trained to use the software and my e-learning course and system administration skills are satisfactory.	( )	( )	( )	( )
		1	**2**	**3**	**4**
A6.4	I learn/gain more knowledge through the e-learning event and consider myself a valuable resource for any help the employee needs.	( )	( )	( )	( )
		1	**2**	**3**	**4**
A7	I am positive about the benefits of e-learning as delivery tool for learning.	( )	( )	( )	( )

Continue to the next page please

	The requirements of the **Pedagogical Dimension** (Anything to do with the art, science or profession of teaching, the application of principles and methods of education, and ways of imparting knowledge, skills and growing desired attitudes and behaviours).	**Strongly disagree**	**Disagree**	**Agree**	Strongly agree
		1	**2**	**3**	**4**
C1	The interaction tools used in the course (mail, chat rooms, bill boards, video conferencing etc.) are separated from (each in their own virtual space) each other and the right number and person/s participates in the activity	( )	( )	( )	( )
		1	**2**	**3**	**4**
C2	The e-learning course provides an online space where learners can be introduced to each other and share information about themselves.	( )	( )	( )	( )
		1	**2**	**3**	**4**
C3	Online activities like discussions, collaborative work, projects & exercises are appropriate/suited to the learning suppose to take place.	( )	( )	( )	( )
		1	**2**	**3**	**4**
C5	Real work related problem cases are presented to the learner from which he can draw his own conclusion during learning activities.	( )	( )	( )	( )
		1	**2**	**3**	**4**
C6	The employee can immediately access the right information resources at the exact moment that he needs it.	( )	( )	( )	( )

		1	2	3	4
C7	There is efficient use of instructional processes like modeling, scaffolding and hinting/coaching right through the e-learning course to assist the learning process.(see description below)	( )	( )	( )	( )

• *Modeling* - the demonstration of how and why to perform certain activities needed for tasks required. It shows employees the reasoning and decision making involved behind each step in completing the task.

• *Scaffolding* (knowledge construction) - cognitive tools (templates) to assist learners to organize their thoughts into structured arguments, represent their thoughts, automate or supplant thinking skills in the execution of the tasks.

• *Coaching* - where vital information or hints to be used in the completion of the tasks are provided/given to the learner i.e. exactly what figures to consider when calculating the cost of a product.

		Strongly disagree	Disagree	Agree	Strongly agree
		1	2	3	4
C12	The general tone, look and feel of the e-learning course is suited to the character of the subject and the users (employees).	( )	( )	( )	( )
		1	2	3	4
C14	The e-learning course material is sensibly divided in modules and each module follows the same sequence of events.	( )	( )	( )	( )
		1	2	3	4
C15	The e-learning course can easily and quickly be modified/changed to meet the employees learning needs.	( )	( )	( )	( )
		1	2	3	4
C22	All learners undergo a test to determine their reading, writing and language skills and the e-learning course provides extra support to those who study in their second or third language.	( )	( )	( )	( )
		1	2	3	4
C23	Various methods are used to assess the learners' performance whilst still busy with the e-learning course.	( )	( )	( )	( )
		1	2	3	4
C24	The size of the virtual learning group did not interfere with my facilitation abilities.	( )	( )	( )	( )

	The requirements of the **Organisational Dimension** (This dimension includes any requirement that the employer has of the training activity to ensure that the organisation stays profitable and viable. It includes managerial activities to ensure that operations are running efficiently, the image as a company is maintained; the administration, policies, procedures, regulations, and *guidelines are being adhered to*).	**Strongly disagree**	**Disagree**	**Agree**	Strongly agree
		1	**2**	**3**	**4**
D2	Each learner registered for the course and received/created his/her own password for security purposes.	( )	( )	( )	( )
		1	**2**	**3**	**4**
D3	Provided the employee protect his password his work is safe and secure and no one else have access to his work or him having access to the work of others.	( )	( )	( )	( )

		Strongly disagree	Disagree	Agree	Strongly agree
		1	**2**	**3**	**4**
D6	Content are checked for accuracy and are being reviewed regularly as well as updated immediately when necessary.	( )	( )	( )	( )
		1	**2**	**3**	4
D13	Various subject matter specialists have access to the e-learning course/s, increasing the contact amongst specialists in the particular field thus enhancing benchmarking and networking to maintain standards of training	( )	( )	( )	( )
		1	**2**	**3**	4
D14	When the e-learning course is used no computers are unattended (not being used) and there is no time wasted due to technology problems, people (learner resources) not being available or when available not occupied with the e-learning course or other work.	( )	( )	( )	( )
		1	**2**	**3**	4
D15	The e-learning course succeeds in creating the right environment for learning to take place	( )	( )	( )	( )

Thank you for your support

Add any comments you might have below please

Should you wish to make any comments to the researcher in person please phone 082 416 9881

E-learning research questionnaire (Manager)

Completing this questionnaire is **voluntary** and **anonymous**. The results will only be published in the aggregate (combined in groups) as part of the outcome of this research project. By completing this questionnaire you consent to participating in the project as an anonymous participant. No identification is required. All responses where participants are known to the researcher will be treated confidentially. Your participation is appreciated.

Definition of e-learning: - "E-learning (electronic learning): 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." (Learningcircuits, 2004).

Instructions Section A:-

- The questions apply only to courses for which you were the responsible manager in your current workplace hosted by your current employer.
- Please mark the appropriate block next to each statement with the letter x between the brackets like this = (X)
- Choose one preference only.
- Where indicated more than one choice can be made.
- TOTAL questions:- 16 (excluding Section A biographical section)

SECTION A

Biographical information. (please complete the following questions about yourself – no identification is required)

		Male			Female
18 Gender		( )			**( )**
	18 – 30 years	**31 – 40 years**	**41 – 50 years**		51 – 65 years
19 Age.	( )	( )	( )		**( )**
20 Race	**African**	**Coloured**	**Indian**	**White**	Other(specify)
	( )	( )	( )	**( )**	
21 What is the name of the most recent/current e-learning course that you're managing? (if you are managing one now – list this course)					

	Less than 2	2 and more but less than 4 courses	4 and more but less than 6 courses	More than 6 courses
22 How many e-learning courses did you manage thus far (Computer learning)?	( )	( )	( )	( )

Can mark more than one	Media Centre	Class room	In employees office his/her own computer	Other (specify)
23 Where did the most recent e-learning course you had to manage took place	( )	( )	( )	

24 What type of e-learning did you manage thus far *(YOU CAN CHOOSE MORE THAN ONE IF APPLICABLE).*		Purely online learning - no face-to-face contact with a facilitator (trainer) or other (employees).	( )
		Blended Learning - combination of online learning and face-to-face contact with the facilitator(trainer) and or other (employees)	( )
		Synchronous: - A virtual classroom. An instructor-led online learning event, in which all participants are logged on to the computer network at the same time and communicate directly with each other through making use of the computer at hand.	( )

		Asynchronous: - Learning in which online interaction between the facilitator (trainer) and employees occurs intermittently with a time delay. Examples are self-paced courses taken via the Internet or CD-ROM, Question and answer mentoring, online discussion groups, and email.	( )
		Instructor-led group :- there is an instructor/trainer to facilitate the learning process	( )
		Self-study – text online: - no instructor, text on computer to read on your own	( )
		Web-based: - Delivery of educational content via a Web browser over the public Internet, a private intranet, or an extranet.	( )
		Computer-based (*CD-ROM*)	( )
		Video/audio tape	( )
		Self-study with subject matter expert to provide support	( )

INSTRUCTIONS SECTION B:-

- In your opinion, rate the importance of each statement made in relation to your e-learning experience in managing the media centre of your current employer.
- Make one choice only.
- The choices range from 1 to 4 where 1 represents that you strongly DISAGREE and 4 that you STRONGLY AGREE.
- In this context (the workplace) the employee means the employee/worker and the educator/facilitator refers to the person directly responsible for the training of the employee.

SECTION B1

Code Office use	The requirements of the **Organisational Dimension** (This dimension includes any requirement that the employer has of the training activity to ensure that the organisation stays profitable and viable. It includes managerial activities to ensure that operations are running efficiently, the image as a company is maintained; the administration, policies, procedures, regulations, and guidelines are being adhered to).	**Strongly disagree**	**Disagree**	**Agree**	Strongly agree
		1	**2**	**3**	4
D1	All the necessary department/s who runs/owns the course/s' contact numbers have been provided on the front page/home page of the e-learning course/s.	( )	( )	( )	( )

		1	**2**	**3**	4

D4	The learning site has a privacy policy which is published and is accessible to learners on entering the course.	( )	( )	( )	( )
		1	2	3	4
D5	A feedback policy exists and it has been communicated to the learners on the particular learning site.	( )	( )	( )	( )
		1	2	3	4
D7	The e-learning course complies with copyright laws.	( )	( )	( )	( )
		1	2	3	4
D8	There is an e-learning strategy and a project team whose roles and responsibilities are known and documented.	( )	( )	( )	( )
		1	2	3	4
D9	A communication structure and a plan for dissemination of information are clearly set out and are/have been followed with the planning and or maintenance of the e-learning course/s.	( )	( )	( )	( )

		Strongly disagree	Disagree	Agree	Strongly agree
		1	**2**	**3**	4
D10	The employees are allowed to follow the e-learning course during working hours and the managers/supervisor is aware of it.	( )	( )	( )	( )
	IGNORE THE NEXT QUESTION IF COURSES ARE BOUGHT OFF THE SHELVE	**1**	**2**	**3**	4
D11	If courses are self developed or development outsourced, a clear process are followed - namely the technical requirements are determined, a needs analysis done; content determined, rapid prototyping and storyboarding took place (can be in conjunction with developer). A production pathway was built, the usability of the e-learning course tested. Quality assurance and testing are done.	( )	( )	( )	( )
		1	**2**	**3**	4
D12	The e-learning course contains specific suggestion given to the learner with regards to netiquette, managing time, what to do in case of technical problems, the place of work and study, and his group work responsibilities.	( )	( )	( )	( )
		1	**2**	**3**	4
D16	A learner survey has been done to determine the learner's satisfaction with the e-learning course	( )	( )	( )	( )

		1	**2**	**3**	4

D17	Specific standards and method to evaluate performance against these standards have been set up to evaluate technical efficiency, user friendliness and educational value.	( )	( )	( )	( )
		1	**2**	**3**	4
D18	There is an e-learning support team with contact numbers available online should anyone need assistance.	( )	( )	( )	( )
		1	**2**	**3**	4
D19	The employee's progress is reviewed intermittently and rewards are given for good progress.	( )	( )	( )	( )
		1	**2**	**3**	4
D20	The e-learning course is an integral part of an existing training delivery system (part and parcel of existing technology as well as career paths/training matrices)	( )	( )	( )	( )
		1	**2**	**3**	4
D21	The same course/s are used all over the organisation (nationally & globally)	( )	( )	( )	( )
		1	**2**	**3**	4
D23	The training improves the employee's job performance and thus the company's performance improves.	( )	( )	( )	( )

Thank you for your support

Please add any comments you may have here

APPENDIX J

PHASE FOUR – CONSENT LETTER FROM THE DEPARTEMENTAL MANAGER FROM THE HUMAN RESOURCE DEPARTMENT

Linette Raulenbach
PO Box 10505
Secunda
2302

31 January 2006

The Departmental Manager: Human Resources

Sasol Synfuels
Private Bag X 1000
Secunda
2302

Dear Sir

I am currently registered as doctoral student at the North West University (student no. 10285288). In order to complete the final stage of my research "An electronic learning readiness model for distance education in the work place", I need to obtain your approval in order to do the following:

- to execute the final research phase of this study in the Sasol Synfuels media training centre;
- to report and publish the results of the study in my thesis;
- to report and/or publish the results in articles and to interested parties.

The results of the study will be reported and published in the aggregate and no particular reference to Sasol Synfuels will be made except to refer to the organisation as a Petrochemical Industry. I am thankful for the support I received from staff members and wish to continue with the study by obtaining your approval.

I hope my request will be considered.

Sincerely,

Linette Raulenbach
Group Leader
SHERQ Academy

I Vlam van Rooyen consent to the fieldwork of the study "An electronic learning readiness model for distance education in the work place" to:

- be executed in the media training centre;
- the results to be reported in the doctoral theses of Linette Raulenbach and to other interested parties; and
- the results to be published in articles

in accordance with the undertaking as mentioned in this letter.

Vlam van Rooyen
Departmental Manager
Human Resources
Sasol Synfuels

APPENDIX K

PHASE FOUR: CROSS TABULATION OF SIGNIFICANT RELATIONSHIPS BETWEEN THE CHARACTERISITCS OF THE LEARNER GROUP AND THE CRITERIA OF THE E-READINESS MODEL

THE HUMAN RESOURCE DIMENSION

Statistical significant relationships between the learner group characteristics and the Human Resource Dimension

Cross Tabulation Frequency/Percent 18. [A6.1] The personal attention I received form the course facilitator is satisfactory.

		Strongly Disagree	Disagree	Agree	Strongly Agree	Row Totals
1. [1] Gender	Male	5	11	119	63	**198**
		2.53%	**5.56%**	**60.1%**	**31.82%**	**85.34%**
	Female	0	0	12	22	**34**
		0%	**0%**	**35.29%**	**64.71%**	**14.66%**
	Column Total	**5**	**11**	**131**	**85**	**232**
	Column Percent	**2.16%**	**4.74%**	**56.47%**	**36.64%**	**100%**

Cross Tabulation Frequency/Percent 10. [A1] Before I started the I have been tested to determine whether I possess the necessary thinking abilities.

		Strongly Disagree	Disagree	Agree	Strongly Agree	Row Totals
2. [2] Age	18 - 30 years	12	17	89	59	177
		6.78%	9.6%	50.28%	33.33%	77.97%
	31 - 40 years	3	6	21	4	34
		8.82%	17.65%	61.76%	11.76%	14.98%
	41 - 50 years	4	1	7	1	13
		30.77%	7.69%	53.85%	7.69%	5.73%
	51 - 65 years	0	2	1	0	3
		0%	66.67%	33.33%	0%	1.32%
	Column Total	19	26	118	64	227
	Column Percent	8.37%	11.45%	51.98%	28.19%	100%

Cross Tabulation Frequency/Percent 14. [A4.2] I am good at taking content apart, analyse it and put it together again

		Strongly Disagree	Disagree	Agree	Strongly Agree	Row Totals
2. [2] Age	18 - 30 years	1	1	107	70	179
		0.56%	0.56%	59.78%	39.11%	77.83%
	31 - 40 years	0	3	21	10	34
		0%	8.82%	61.76%	29.41%	14.78%
	41 - 50 years	0	1	9	4	14
		0%	7.14%	64.29%	28.57%	6.09%
	51 - 65 years	0	2	1	0	3
		0%	66.67%	33.33%	0%	1.3%
	Column Total	1	7	138	84	230
	Column Percent	0.43%	3.04%	60%	36.52%	100%

Cross Tabulation Frequency/Percent 15. [A4.3] I know how to learn and make use of several learning methods.

		Strongly Disagree	Disagree	Agree	Strongly Agree	**Row Totals**
2. [2] Age	18 - 30 years	1	9	104	66	**180**
		0.56%	**5%**	**57.78%**	**36.67%**	**77.25%**
	31 - 40 years	0	2	25	9	**36**
		0%	**5.56%**	**69.44%**	**25%**	**15.45%**
	41 - 50 years	0	2	9	3	**14**
		0%	**14.29%**	**64.29%**	**21.43%**	**6.01%**
	51 - 65 years	0	2	1	0	**3**
		0%	**66.67%**	**33.33%**	**0%**	**1.29%**
	Column Total	**1**	**15**	**139**	**78**	**233**
	Column Percent	**0.43%**	**6.44%**	**59.66%**	**33.48%**	**100%**

Cross Tabulation Frequency/Percent 21. [A10] I am comfortable that I was allowed enough privacy to get used to the course ...

		Strongly Disagree	Disagree	Agree	Strongly Agree	**Row Totals**
2. [2] Age	18 - 30 years	1	4	94	78	**177**
		0.56%	**2.26%**	**53.11%**	**44.07%**	**76.62%**
	31 - 40 years	1	2	22	10	**35**
		2.86%	**5.71%**	**62.86%**	**28.57%**	**15.15%**
	41 - 50 years	0	1	9	5	**15**
		0%	**6.67%**	**60%**	**33.33%**	**6.49%**
	51 - 65 years	0	2	2	0	**4**
		0%	**50%**	**50%**	**0%**	**1.73%**
	Column Total	**2**	**9**	**127**	**93**	**231**
	Column Percent	**0.87%**	**3.9%**	**54.98%**	**40.26%**	**100%**

Cross Tabulation Frequency/Percent 22. [A11] Whether I possess the necessary pre-knowledge have been determined beforehand.

		Strongly Disagree	Disagree	Agree	Strongly Agree	**Row Totals**
2. [2] Age	18 - 30 years	5	15	101	56	**177**
		2.82%	**8.47%**	**57.06%**	**31.64%**	**77.63%**
	31 - 40 years	0	2	27	5	**34**
		0%	**5.88%**	**79.41%**	**14.71%**	**14.91%**
	41 - 50 years	1	0	9	3	**13**
		7.69%	**0%**	**69.23%**	**23.08%**	**5.7%**
	51 - 65 years	1	1	2	0	**4**
		25%	**25%**	**50%**	**0%**	**1.75%**
	Column Total	**7**	**18**	**139**	**64**	**228**
	Column Percent	**3.07%**	**7.89%**	**60.96%**	**28.07%**	**100%**

Cross Tabulation Frequency/Percent 18. [A6.1] The personal attention I received from the facilitators is satisfactory.

		Strongly Disagree	Disagree	Agree	Strongly Agree	**Row Totals**
3. [3] Race	African	0	5	77	57	**139**
		0%	**3.6%**	**55.4%**	**41.01%**	**59.91%**
	Coloured	1	0	1	1	**3**
		33.33%	**0%**	**33.33%**	**33.33%**	**1.29%**
	Indian	4	1	2	4	**11**
		36.36%	**9.09%**	**18.18%**	**36.36%**	**4.74%**
	White	0	5	51	23	**79**
		0%	**6.33%**	**64.56%**	**29.11%**	**34.05%**
	Other	0	0	0	0	**0**
		0%	**0%**	**0%**	**0%**	**0%**
	Column Total	**5**	**11**	**131**	**85**	**232**
	Column Percent	**2.16%**	**4.74%**	**56.47%**	**36.64%**	**100%**

Cross Tabulation Frequency/Percent 19. [A8] I have been prepared for the course and am convinced of the benefits.

		Strongly Disagree	Disagree	Agree	Strongly Agree	**Row Totals**
3. [3] Race	African	3	16	71	45	**135**
		2.22%	**11.85%**	**52.59%**	**33.33%**	**59.21%**
	Coloured	1	1	0	1	**3**
		33.33%	**33.33%**	**0%**	**33.33%**	**1.32%**
	Indian	0	0	8	3	**11**
		0%	**0%**	**72.73%**	**27.27%**	**4.82%**
	White	1	6	51	21	**79**
		1.27%	**7.59%**	**64.56%**	**26.58%**	**34.65%**
	Other	0	0	0	0	**0**
		0%	**0%**	**0%**	**0%**	**0%**
	Column Total	**5**	**23**	**130**	**70**	**228**
	Column Percent	**2.19%**	**10.09%**	**57.02%**	**30.7%**	**100%**

Cross Tabulation Frequency/Percent 21. [A10] I am comfortable that I was allowed enough privacy to test the course.

		Strongly Disagree	Disagree	Agree	Strongly Agree	**Row Totals**
3. [3] Race	African	1	6	70	59	**136**
		0.74%	**4.41%**	**51.47%**	**43.38%**	**59.13%**
	Coloured	1	0	0	2	**3**
		33.33%	**0%**	**0%**	**66.67%**	**1.3%**
	Indian	0	0	7	4	**11**
		0%	**0%**	**63.64%**	**36.36%**	**4.78%**
	White	0	3	48	29	**80**
		0%	**3.75%**	**60%**	**36.25%**	**34.78%**
	Other	0	0	0	0	**0**
		0%	**0%**	**0%**	**0%**	**0%**
	Column Total	**2**	**9**	**125**	**94**	**230**
	Column Percent	**0.87%**	**3.91%**	**54.35%**	**40.87%**	**100%**

Cross Tabulation Frequency/Percent	22. [A11] Whether I possess the necessary thinking abilities have been tested beforehand.					
		Strongly Disagree	Disagree	Agree	Strongly Agree	**Row Totals**
6. [6] How many times have ...	Less than 2	5	10	54	26	**95**
		5.26%	**10.53%**	**56.84%**	**27.37%**	**45.45%**
	2 and more but less than 4 courses	0	5	21	8	**34**
		0%	**14.71%**	**61.76%**	**23.53%**	**16.27%**
	4 and more but less than 6 courses	0	0	12	3	**15**
		0%	**0%**	**80%**	**20%**	**7.18%**
	more than 6 courses	1	2	39	23	**65**
		1.54%	**3.08%**	**60%**	**35.38%**	**31.1%**
	Column Total	**6**	**17**	**126**	**60**	**209**
	Column Percent	**2.87%**	**8.13%**	**60.29%**	**28.71%**	**100%**

THE TECHNOLOGY DIMENSION

Statistical significant relationships between the learner group characteristics and the Technology Dimension

Cross Tabulation Frequency/Percent 24. [B6] Accessing the computer course is easy and simple.

		Strongly Disagree	Disagree	Agree	Strongly Agree	Row Totals
2. [2] Age	18 - 30 years	1	10	97	70	**178**
		0.56%	**5.62%**	**54.49%**	**39.33%**	**77.06%**
	31 - 40 years	0	4	23	7	**34**
		0%	**11.76%**	**67.65%**	**20.59%**	**14.72%**
	41 - 50 years	0	2	9	4	**15**
		0%	**13.33%**	**60%**	**26.67%**	**6.49%**
	51 - 65 years	1	1	2	0	**4**
		25%	**25%**	**50%**	**0%**	**1.73%**
	Column Total	**2**	**17**	**131**	**81**	**231**
	Column Percent	**0.87%**	**7.36%**	**56.71%**	**35.06%**	**100**

Cross Tabulation Frequency/Percent 28. [B10] The computer course was technically simple to use.

		Strongly Disagree	Disagree	Agree	Strongly Agree	Row Totals
2. [2] Age	18 - 30 years	0	5	97	72	**174**
		0%	**2.87%**	**55.75%**	**41.38%**	**76.99%**
	31 - 40 years	0	2	17	14	**33**
		0%	**6.06%**	**51.52%**	**42.42%**	**14.6%**
	41 - 50 years	0	4	7	4	**15**
		0%	**26.67%**	**46.67%**	**26.67%**	**6.64%**
	51 - 65 years	1	1	2	0	**4**
		25%	**25%**	**50%**	**0%**	**1.77%**
	Column Total	**1**	**12**	**123**	**90**	**226**
	Column Percent	**0.44%**	**5.31%**	**54.42%**	**39.82%**	**100%**

Cross Tabulation Frequency/Percent

24. [B6] Accessing the computer course is easy and simple.

3. [3] Race		Strongly Disagree	Disagree	Agree	Strongly Agree	Row Totals
	African	0	13	76	48	137
		0%	9.49%	55.47%	35.04%	59.57%
	Coloured	1	0	1	1	3
		33.33%	0%	33.33%	33.33%	1.3%
	Indian	0	1	6	4	11
		0%	9.09%	54.55%	36.36%	4.78%
	White	1	3	47	28	79
		1.27%	3.8%	59.49%	35.44%	34.35%
	Other	0	0	0	0	0
		0%	0%	0%	0%	0%
	Column Total	2	17	130	81	230
	Column Percent	0.87%	7.39%	56.52%	35.22%	100%

Cross Tabulation Frequency/Percent

30. [B12] Finding information is easy (index and sitemap present).

3. [3] Race		Strongly Disagree	Disagree	Agree	Strongly Agree	Row Totals
	African	1	4	71	56	132
		0.76%	3.03%	53.79%	42.42%	59.19%
	Coloured	1	0	1	1	3
		33.33%	0%	33.33%	33.33%	1.35%
	Indian	0	0	6	3	9
		0%	0%	66.67%	33.33%	4.04%
	White	0	3	45	31	79
		0%	3.8%	56.96%	39.24%	35.43%
	Other	0	0	0	0	0
		0%	0%	0%	0%	0%
	Column Total	2	7	123	91	223
	Column Percent	0.9%	3.14%	55.16%	40.81%	100%

Cross Tabulation Frequency/Percent 31 [B13] The particular computer delivery system met my training needs.

		Strongly Disagree	Disagree	Agree	Strongly Agree	**Row Totals**
3. [3] Race	African	0	3	75	55	**133**
		0%	**2.26%**	**56.39%**	**41.35%**	**60.45%**
	Coloured	1	0	1	1	**3**
		33.33%	**0%**	**33.33%**	**33.33%**	**1.36%**
	Indian	0	0	6	3	**9**
		0%	**0%**	**66.67%**	**33.33%**	**4.09%**
	White	1	0	47	27	**75**
		1.33%	**0%**	**62.67%**	**36%**	**34.09%**
	Other	0	0	0	0	**0**
		0%	**0%**	**0%**	**0%**	**0%**
	Column Total	**2**	**3**	**129**	**86**	**220**
	Column Percent	**0.91%**	**1.36%**	**58.64%**	**39.09%**	**100%**

Cross Tabulation Frequency/Percent 23. [B1] The computer course was engaging.

		Strongly Disagree	Disagree	Agree	Strongly Agree	**Row Totals**
6. [6] How many times have ...	Less than 2	0	1	50	44	**95**
		0%	**1.05%**	**52.63%**	**46.32%**	**45.24%**
	2 and more but less than 4 courses	1	3	23	9	**36**
		2.78%	**8.33%**	**63.89%**	**25%**	**17.14%**
	4 and more but less than 6 courses	0	1	13	1	**15**
		0%	**6.67%**	**86.67%**	**6.67%**	**7.14%**
	more than 6 courses	1	3	31	29	**64**
		1.56%	**4.69%**	**48.44%**	**45.31%**	**30.48%**
	Column Total	**2**	**8**	**117**	**83**	**210**
	Column Percent	**0.95%**	**3.81%**	**55.71%**	**39.52%**	**100%**

Cross Tabulation Frequency/Percent

27. [B8.2] Where there were option to download files the size of the files were indicated.

		Strongly Disagree	Disagree	Agree	Strongly Agree	**Row Totals**
6. [6] How many times have ...	Less than 2	5	19	39	19	**82**
		6.1%	**23.17%**	**47.56%**	**23.17%**	**43.85%**
	2 and more but less than 4 courses	2	9	21	1	**33**
		6.06%	**27.27%**	**63.64%**	**3.03%**	**17.65%**
	4 and more but less than 6 courses	0	1	9	2	**12**
		0%	**8.33%**	**75%**	**16.67%**	**6.42%**
	more than 6 courses	6	4	38	12	**60**
		10%	**6.67%**	**63.33%**	**20%**	**32.09%**
	Column Total	**13**	**33**	**107**	**34**	**187**
	Column Percent	**6.95%**	**17.65%**	**57.22%**	**18.18%**	**100%**

THE PEDAGOGY DIMENSION

Statistical significant relationships between the learner group characteristics and the Pedagogy Dimension

Cross Tabulation Frequency/Percent 43. [C18.2] I was allowed to wor ...

		Strongly Disagree	Disagree	Agree	Strongly Agree	Row Totals
1. [1] Gender	Male	0	4	103	82	**189**
		0%	**2.12%**	**54.5%**	**43.39%**	**85.14%**
	Female	1	2	14	16	**33**
		3.03%	**6.06%**	**42.42%**	**48.48%**	**14.86%**
	Column Total	**1**	**6**	**117**	**98**	**222**
	Column Percent	**0.45%**	**2.7%**	**52.7%**	**44.14%**	**100%**

Cross Tabulation Frequency/Percent 32. [C8] I found the computer course sensitive to my age race and gender.

		Strongly Disagree	Disagree	Agree	Strongly Agree	Row Totals
2. [2] Age	18 - 30 years	12	7	89	58	**166**
		7.23%	**4.22%**	**53.61%**	**34.94%**	**76.5%**
	31 - 40 years	1	5	20	8	**34**
		2.94%	**14.71%**	**58.82%**	**23.53%**	**15.67%**
	41 - 50 years	0	1	8	4	**13**
		0%	**7.69%**	**61.54%**	**30.77%**	**5.99%**
	51 - 65 years	0	2	2	0	**4**
		0%	**50%**	**50%**	**0%**	**1.84%**
	Column Total	**13**	**15**	**119**	**70**	**217**
	Column Percent	**5.99%**	**6.91%**	**54.84%**	**32.26%**	**100%**

Cross Tabulation Frequency/Percent 43. [C18.2] I was allowed to work at my own pace.

		Strongly Disagree	Disagree	Agree	Strongly Agree	Row Totals
2. [2] Age	18 - 30 years	0	5	89	77	**171**
		0%	**2.92%**	**52.05%**	**45.03%**	**76.68%**
	31 - 40 years	0	0	17	17	**34**
		0%	**0%**	**50%**	**50%**	**15.25%**
	41 - 50 years	0	0	11	3	**14**
		0%	**0%**	**78.57%**	**21.43%**	**6.28%**
	51 - 65 years	1	1	2	0	**4**
		25%	**25%**	**50%**	**0%**	**1.79%**
	Column Total	**1**	**6**	**119**	**97**	**223**
	Column Percent	**0.45%**	**2.69%**	**53.36%**	**43.5%**	**100%**

Cross Tabulation Frequency/Percent 44. [C19] I am comfortable with the course design and knew what was expected of me.

		Strongly Disagree	Disagree	Agree	Strongly Agree	Row Totals
2. [2] Age	18 - 30 years	2	6	95	68	**171**
		1.17%	**3.51%**	**55.56%**	**39.77%**	**77.73%**
	31 - 40 years	0	0	17	16	**33**
		0%	**0%**	**51.52%**	**48.48%**	**15%**
	41 - 50 years	0	1	8	3	**12**
		0%	**8.33%**	**66.67%**	**25%**	**5.45%**
	51 - 65 years	0	2	2	0	**4**
		0%	**50%**	**50%**	**0%**	**1.82%**
	Column Total	**2**	**9**	**122**	**87**	**220**
	Column Percent	**0.91%**	**4.09%**	**55.45%**	**39.55%**	**100**

Cross Tabulation Frequency/Percent 45. [C20] I received relevant and timely feedback.

		Strongly Disagree	Disagree	Agree	Strongly Agree	**Row Totals**
2. [2] Age	18 - 30 years	4	15	96	55	**170**
		2.35%	**8.82%**	**56.47%**	**32.35%**	**78.34%**
	31 - 40 years	0	3	18	11	**32**
		0%	**9.38%**	**56.25%**	**34.38%**	**14.75%**
	41 - 50 years	0	1	10	2	**13**
		0%	**7.69%**	**76.92%**	**15.38%**	**5.99%**
	51 - 65 years	0	2	0	0	**2**
		0%	**100%**	**0%**	**0%**	**0.92%**
	Column Total	**4**	**21**	**124**	**68**	**217**
	Column Percent	**1.84%**	**9.68%**	**57.14%**	**31.34%**	**100%**

Cross Tabulation Frequency/Percent 46. [C21] I was given enough time and resource to complete activities..

		Strongly Disagree	Disagree	Agree	Strongly Agree	**Row Totals**
2. [2] Age	18 - 30 years	1	3	92	69	**165**
		0.61%	**1.82%**	**55.76%**	**41.82%**	**76.39%**
	31 - 40 years	0	0	19	15	**34**
		0%	**0%**	**55.88%**	**44.12%**	**15.74%**
	41 - 50 years	0	2	8	3	**13**
		0%	**15.38%**	**61.54%**	**23.08%**	**6.02%**
	51 - 65 years	0	2	2	0	**4**
		0%	**50%**	**50%**	**0%**	**1.85%**
	Column Total	**1**	**7**	**121**	**87**	**216**
	Column Percent	**0.46%**	**3.24%**	**56.02%**	**40.28%**	**100%**

Cross Tabulation Frequency/Percent

35. [C9.2] The computer course fulfilled my need to be efficient at work.

		Strongly Disagree	Disagree	Agree	Strongly Agree	Row Totals
3. [3] Race	African	2	7	75	50	134
		1.49%	5.22%	55.97%	37.31%	60.09%
	Coloured	1	0	1	1	3
		33.33%	0%	33.33%	33.33%	1.35%
	Indian	0	2	6	1	9
		0%	22.22%	66.67%	11.11%	4.04%
	White	0	4	51	22	77
		0%	5.19%	66.23%	28.57%	34.53%
	Other	0	0	0	0	0
		0%	0%	0%	0%	0%
	Column Total	3	13	133	74	223
	Column Percent	1.35%	5.83%	59.64%	33.18%	100%

Cross Tabulation Frequency/Percent

37. [C10] The physical learning environment was conducive to my learning needs.

		Strongly Disagree	Disagree	Agree	Strongly Agree	Row Totals
3. [3] Race	African	1	3	82	47	133
		0.75%	2.26%	61.65%	35.34%	59.91%
	Coloured	1	0	0	2	3
		33.33%	0%	0%	66.67%	1.35%
	Indian	0	0	5	4	9
		0%	0%	55.56%	44.44%	4.05%
	White	0	2	50	25	77
		0%	2.6%	64.94%	32.47%	34.68%
	Other	0	0	0	0	0
		0%	0%	0%	0%	0%
	Column Total	2	5	137	78	222
	Column Percent	0.9%	2.25%	61.71%	35.14%	100%

Cross Tabulation Frequency/Percent 38. [C11] Online instruction was given on how to use the course.

3. [3] Race		Strongly Disagree	Disagree	Agree	Strongly Agree	Row Totals
	African	1	9	82	41	133
		0.75%	6.77%	61.65%	30.83%	59.91%
	Coloured	1	1	1	0	3
		33.33%	33.33%	33.33%	0%	1.35%
	Indian	0	2	5	2	9
		0%	22.22%	55.56%	22.22%	4.05%
	White	3	7	46	21	77
		3.9%	9.09%	59.74%	27.27%	34.68%
	Other	0	0	0	0	0
		0%	0%	0%	0%	0%
	Column Total	5	19	134	64	222
	Column Percent	2.25%	8.56%	60.36%	28.83%	100%

Cross Tabulation Frequency/Percent 39. [C13] The course allowed for different routes to follow.

3. [3] Race		Strongly Disagree	Disagree	Agree	Strongly Agree	Row Totals
	African	1	10	75	44	130
		0.77%	7.69%	57.69%	33.85%	59.36%
	Coloured	1	0	0	2	3
		33.33%	0%	0%	66.67%	1.37%
	Indian	0	0	5	4	9
		0%	0%	55.56%	44.44%	4.11%
	White	1	4	45	27	77
		1.3%	5.19%	58.44%	35.06%	35.16%
	Other	0	0	0	0	0
		0%	0%	0%	0%	0%
	Column Total	3	14	125	77	219
	Column Percent	1.37%	6.39%	57.08%	35.16%	100%

Cross Tabulation Frequency/Percent

40. [C16] The course content was relevant and appropriate for my job.

		Strongly Disagree	Disagree	Agree	Strongly Agree	Row Totals
3. [3] Race	African	1	4	66	60	131
		0.76%	3.05%	50.38%	45.8%	59.28%
	Coloured	1	0	1	1	3
		33.33%	0%	33.33%	33.33%	1.36%
	Indian	0	0	6	3	9
		0%	0%	66.67%	33.33%	4.07%
	White	1	5	49	23	78
		1.28%	6.41%	62.82%	29.49%	35.29%
	Other	0	0	0	0	0
		0%	0%	0%	0%	0%
	Column Total	3	9	122	87	221
	Column Percent	1.36%	4.07%	55.2%	39.37%	100%

Cross Tabulation Frequency/Percent

45. [C20] I received relevant and timely feedback.

		Strongly Disagree	Disagree	Agree	Strongly Agree	Row Totals
3. [3] Race	African	2	11	74	45	132
		1.52%	8.33%	56.06%	34.09%	61.11%
	Coloured	1	0	1	1	3
		33.33%	0%	33.33%	33.33%	1.39%
	Indian	0	2	5	1	8
		0%	25%	62.5%	12.5%	3.7%
	White	1	8	43	21	73
		1.37%	10.96%	58.9%	28.77%	33.8%
	Other	0	0	0	0	0
		0%	0%	0%	0%	0%
	Column Total	4	21	123	68	216
	Column Percent	1.85%	9.72%	56.94%	31.48%	100%

Cross Tabulation Frequency/Percent 46. [C21] I was given enough time to complete activities.

		Strongly Disagree	Disagree	Agree	Strongly Agree	Row Totals
3. [3] Race	African	0	4	70	52	126
		0%	3.17%	55.56%	41.27%	58.6%
	Coloured	1	0	0	1	2
		50%	0%	0%	50%	0.93%
	Indian	0	0	5	4	9
		0%	0%	55.56%	44.44%	4.19%
	White	0	3	45	30	78
		0%	3.85%	57.69%	38.46%	36.28%
	Other	0	0	0	0	0
		0%	0%	0%	0%	0%
	Column Total	1	7	120	87	215
	Column Percent	0.47%	3.26%	55.81%	40.47%	100%

Cross Tabulation Frequency/Percent 38. [C11] Online instruction was given on how to use my time.

		Strongly Disagree	Disagree	Agree	Strongly Agree	Row Totals
6. [6] How many times have ...	Less than 2	2	13	55	22	92
		2.17%	14.13%	59.78%	23.91%	44.66%
	2 and more but less than 4 courses	0	2	26	7	35
		0%	5.71%	74.29%	20%	16.99%
	4 and more but less than 6 courses	1	0	12	2	15
		6.67%	0%	80%	13.33%	7.28%
	more than 6 courses	1	5	31	27	64
		1.56%	7.81%	48.44%	42.19%	31.07%
	Column Total	4	20	124	58	206
	Column Percent	1.94%	9.71%	60.19%	28.16%	100%

Cross Tabulation Frequency/Percent	45. [C20] I received relevant and timely feedback.					
		Strongly Disagree	Disagree	Agree	Strongly Agree	**Row Totals**
6. [6] How many times have . .	Less than 2	2	10	51	26	**89**
		2.25%	**11.24%**	**57.3%**	**29.21%**	**44.5%**
	2 and more but less than 4 courses	0	7	21	5	**33**
		0%	**21.21%**	**63.64%**	**15.15%**	**16.5%**
	4 and more but less than 6 courses	0	0	11	3	**14**
		0%	**0%**	**78.57%**	**21.43%**	**7%**
	more than 6 courses	2	2	31	29	**64**
		3.12%	**3.12%**	**48.44%**	**45.31%**	**32%**
	Column Total	**4**	**19**	**114**	**63**	**200**
	Column Percent	**2%**	**9.5%**	**57%**	**31.5%**	**100%**

THE ORGANISATIONAL DIMENSION

Statistical significant relationships between the learner group characteristics and the Organisational Dimension

Cross Tabulation Frequency/Percent 47. [D22] I am positive towards self studying and my colleagues and managers support it

		Strongly Disagree	Disagree	Agree	Strongly Agree	Row Totals
3. [3] Race	African	0	3	71	56	**130**
		0%	**2.31%**	**54.62%**	**43.08%**	**59.09%**
	Coloured	0	1	0	2	**3**
		0%	**33.33%**	**0%**	**66.67%**	**1.36%**
	Indian	1	0	5	3	**9**
		11.11%	**0%**	**55.56%**	**33.33%**	**4.09%**
	White	0	2	46	30	**78**
		0%	**2.56%**	**58.97%**	**38.46%**	**35.45%**
	Other	0	0	0	0	**0**
		0%	**0%**	**0%**	**0%**	**0%**
	Column Total	**1**	**6**	**122**	**91**	**220**
	Column Percent	**0.45%**	**2.73%**	**55.45%**	**41.36%**	**100%**