Development of a Constructivist Instructional Design Model for corporate e-learning in South Africa: a best e-learning practices case study

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Declaration

This research has been carried out as partial fulfilment of the requirement for the award of a degree of Master of Arts (Digital Media) in the Faculty of Human Sciences at the University of KwaZulu-Natal. I declare that this thesis is my own work that I have achieved through consulting various sources acknowledged here.

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Abstract

The goal of this research was the development of an e-learning model to address the needs of the South African corporate sector. To do this it was necessary to reach an understanding of: the South African corporate training needs; the difference between training, education, academic learning and learning theory; academic e-learning best practices and their integration into the e-learning model; various instructional /learning design models and how they can enhance e-learning in the corporate sector in South Africa and general and legislative requirements for the development of e-learning portals in the South African corporate sector.

Reeves and Hedberg (2003) recommend that research with a development goal should use an eclectic-mixed methods-pragmatic paradigm, and multiple research instruments to collect data. This study was conducted within an ICT company that designs e-learning courses for different companies. Three corporate learning portals developed by this company from the INSETA and BANKSETA were carefully interrogated to see if there is a match between the stated and the applied e-learning design methodology. A qualitative approach, with instructional design interviews, educational expert review forms and subject matter expert review forms was used for primary data collection and review of current e-learning design practices. The data was categorised into themes and topics using QSR NVivo 7. The patterns that emerged lead to a better understanding of local issues and these were linked to the best e-learning practices identified by the literature review and elearning practice in the South African corporate sector..

The SAeLAD model was then developed based on Trivedi's e-learning best practices and using 13 e-learning design field-based findings namely; qualifications of practitioners, constructivism versus instructivism, learning through activities to support theoretical knowledge, need for a traceable recordkeeping system, testing and re-testing of the learning environment, incorporation of special needs in the learning design, access to ICT, level of ICT competence, learner motivation, prior experiences of learning, learners' prior knowledge, cultural backgrounds and language skills and roles and responsibilities of the design team. Comments from practitioners were incorporated in the final design.

List of Acronyms

ADDIE	Analyse Design Develop Implement Evaluate
BANKSETA	Banking Sector Training Authority
CBT	Computer Based Training
CMC	Computer Mediated Communication
ETQA	Education and Training Quality Assurance
FAIS	Financial Advisory and Intermediary Services
FMR	Final Model Reviewer
ICT	Information and Communication Technology
ID	Instructional Design
INSETA	Insurance Sector Training Authority
LD	Learning Design
NQF	National Qualifications Framework
NSB	National Standards Body
PBL	Problem Based Learning
RP	Respondent
SAeLAD	South African e-Learning Activity Design
SAQA	South African Qualifications Authorities
SETA	Skills Education Training Authority
SME	Subject Matter Expert
UNESCO	United Nations Educational, Scientific and Cultural Organization

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Chapter One: Introduction

1.1 Introduction

This study reports on the development of a constructivist instructional design (ID) model that integrates e-learning best practices and modern learning approaches with e-learning development in corporate South Africa. It is hoped that the developed ID model will be used to guide the development of corporate e-learning in South Africa.

The project is based on the premise that there has been extensive research into online "interactive learning systems" in formal education settings (Reeves & Hedberg, 2003: 3) and this technology is slowly gaining popularity in the corporate sector for in-house, in-service training (Reeves, Herrington and Oliver, 2002: np). However, recent studies indicate that the corporate online learning systems have not been subjected to the same rigorous research as the tertiary educational systems (Dagada & Jakovljevic, 2005: 113; Jaffe, 1989: 957; Reeves, Herrington and Oliver, 2002). In particular Dagada and Jakovljevic (2005) assert that little research has been done on the application of Computer Based Training (CBT) in the South African corporate environment, and particularly in the banking sector Dagada (2004). Jaffe (1989: 2) agrees although he argues that this scarcity of peer reviewed research may largely be as a result of a significant financial incentive for corporations to keep their research findings secret. In addition to this concern and while recognizing that there are possibly some excellent unreported initiatives in the private sector, there also appears to be a lack of understanding of educational theory and particularly educational theory as it applies to e-learning in this sector (Urdan and Weggen, 2000). Oakes and Rengajan (2002) cited in Dagada & Jakovljevic (2005:196) highlight "how the online learning strategies (collaborative learning, cooperative learning, experiential learning, discussion groups, drill and simulation) and tools (multimedia, calendar tools, communication tools, concept maps, chat tools, assignment tools and assessment tools) could add value in the South African corporate training environment". Botha and Simelane (2007) state that SAQA (1997) encourages the use of technology (e-learning) to enhance skills development and lifelong learning in the South African workplace. Furthermore, SAQA (1997) states in their sixth critical outcome that all learning processes should enable the learners to utilize scientific and technological innovations effectively and critically.

Trivedi (undated) outlines seven areas of e-learning best practices: (1) course planning preparation, (2) technical infrastructure and support, (3) instructor training, (4) initial online class meetings/orientations, (5) diversity of instructional material, (6) course structure, and finally (7) the student assessment and course evaluation. These best practices drawn by Trivedi and the principles of constructivist learning outlined by Resta (2002: 19) forms the basis of the research and assisted in exploring the following research objectives:

1.2 Research Objectives

The objective of this research was to develop an e-learning design model for the South African corporate sector. In order to do this it was necessary to

1. understand South African corporate training needs
2. explore the differences between training, education and academic learning and learning theory
3. examine the academic e-learning best practices and the possibility of their integration into the ID model in the corporate sector
4. investigate the Instructional /Learning Design models and how they can enhance e-learning in the corporate sector in South Africa
5. identify the general and legislative requirements for the development of e-learning portals of the South African corporate market, and
6. establish an understanding of e-learning in the corporate sector as it is currently practiced.

1.3 Rationale / Significance of the study

According to Dorin, Demmin and Gabel (1990) a model "is a picture that helps us understand something we cannot see or experience directly". The objective of the study was to develop a constructivist ID model based on academic e-learning best practices, taking into account the unique requirements for South African corporate sector.

Reporting on a study conducted in the United States of America, Gordon (2002) claims that e-learning costs less than face-to-face training stating that it costs US$10 per person to present e-learning training compared to US$65 for face-to-face training. Similar studies in South Africa show a 90% savings since the use of e-learning; and as a result corporations in South Africa are currently spending large amounts of money investing in new technologies to establish the use of e-learning and save in their skills development budget (Faherty 2002: 8, Seufert, undated: 3). These supposed cost savings are debatable, for instance Clark (2007: np) argues:

> *With most instructor led classes, a lot of the material is put into outlined form as it is expected that the instructor will fill in a lot of the blanks, such as integrating or leading the learning methods. With elearning, you have to put in all the content and get it to perform the learning methods by itself. Thus elearning has traditionally been a lot more expensive up front as it cost more to develop. However, the real savings come from other factors, such as travel, seat time, and administration costs. It generally takes at least four times as long to build elearning, than it does classroom training. Of course this depends on such factors as the tools you are using, learning methods, and what content you already have that are learner-friendly, rather than instructor-friendly.*

In addition Reeves and Hedberg (2003) raise concerns stating that the use of the best e-learning practices in course development has not been clearly addressed. Consequently, there is a need to highlight:

- Differences between tertiary education and corporate training needs to understand their different needs
- The guiding best practices of online learning in an academic environment, in order to extrapolate researched best practices in tertiary education and apply them, where relevant, to the corporate sector and
- Learning theories that best accommodate the S.A. corporate e-learning requirements as well as fostering of life long learning in the current information age.

Addressing the abovementioned issues has assisted in the formulation of a model that can be used for future development of corporate e-learning courses and form the basis of a constructivist e-learning/instructional design model specifically for the South African corporate sector.

Chapter Two: Research Methodology

2.1 Introduction

The purpose of this chapter is to illustrate the research paradigm and data collection procedures that were followed to investigate the incorporation of e-learning best practices and modern learning approaches with e-learning development in the South African corporate sector. The research paradigm and methodology play a crucial role in directing and forming the research study.

2.2 The research paradigm

The research paradigm directs the way knowledge is studied and interpreted (MacKenzie & Knipe, 2006: 01). Bogdan and Biklen (1998: 22) define paradigm as “a loose collection of logically related assumptions, concepts, or propositions that orient thinking and research”. Mac Naughton, Rolfe and Siraj-Blatchford (2001: 32) are of the view that a research paradigm comprises of three fundamentals; the belief about the nature of knowledge, a methodology and criteria for assessing validity.

2.2.1 The different paradigms

Reeves and Hedberg (2003) outline four distinct paradigms that influence research in educational issues.

- Positivist / Analytic-Empirical-Positivist-Quantitative Paradigm: This paradigm is based on "mechanistic, deterministic reality” (Reeves & Hedberg, 2003: 30), it seeks to define the goals of the research study through experience and experimentation and measures real variables (ibid). Mertens (2005: 07) agrees with this definition by saying that a positivist paradigm is based on “rationalistic, empiricist philosophy”. Whereas O’Leary (2004: 05) asserts that the positivist paradigm aims at analysing a theory or describes a practice “through observation and measurement in order to predict and control forces that surround us”. According to Reeves and Hedberg (2003) this paradigm is relied upon to provide accurate feedback evaluation of the efficiency of one program over another, however, comparison of programs was not the goal of this research study and this paradigm has not been used here.

- Interpretivist / Constructivist-Hermeneutic-Interpretivist-Qualitative Paradigm : According to Cohen and Manion (1994: 36) the interpretivist research paradigm intends to ascertain a proper understanding of “the world of human experience”. It relies more on the research respondents’ views and experiences. Hermeneutics helps the researcher generate a better perception of the principles underpinning the respondents’ ideas (Schubert & Schubert, 1990) and this concurs with Mertens’ (2005:12) view of ‘socially-constructed reality’. This research makes

extensive use of “expert opinions” and views of practitioners in “real world” environments. A variety of methodologies (described below) applicable to this paradigm have been used in the research reported here.

- Transformative / Critical Theory-Neomarxist-Postmodern-Praxis Paradigm.
  This paradigm is concerned with “critical theory” and “questions of power, control” and unequal distribution of benefits (Reeves & Hedberg, 2003: 33). There is no attempt in this research to question the status quo or challenge current socio-political elements that occur in the distribution of knowledge and therefore this paradigm is not applied in this research.

- Pragmatic / Eclectic-Mixed Methods-Pragmatic Paradigm
  According to Reeves and Hedberg (2003: 35) proponents of this paradigm are usually focused on “the practical problems that confront them” and “they view modes of inquiry as tools to better understanding and more effective problem solving”. Of particular importance in understanding the place of this research Reeves and Hedberg (2003: 35) state “they [proponents of this paradigm] are honest with themselves and their audiences about the tentative and probabilistic nature of the recommendation they make”. The nature of the research problem guides the research study and allows the use of mixed methods in evaluating multi-dimensional studies (Creswell, 2003: 11). Pascale, Millerman and Gioja (2000) argue that the pragmatic paradigm is the most suitable approach for conducting multifaceted research. The research study is guided by the pragmatic paradigm because of its “problem-centred approach”, focus on “real-world practice orientation” and provision of the opportunities to use different research tools (MacKenzie & Knipe, 2006: np)

  This pragmatic paradigm is considered the ‘best fit’ for this research where a ‘real world’ problem is posed regarding e-learning in South Africa and multiple sources of information including a literature review, expert opinions, practitioner guides are used to offer a solution that is at best “tentative and probabilistic”.

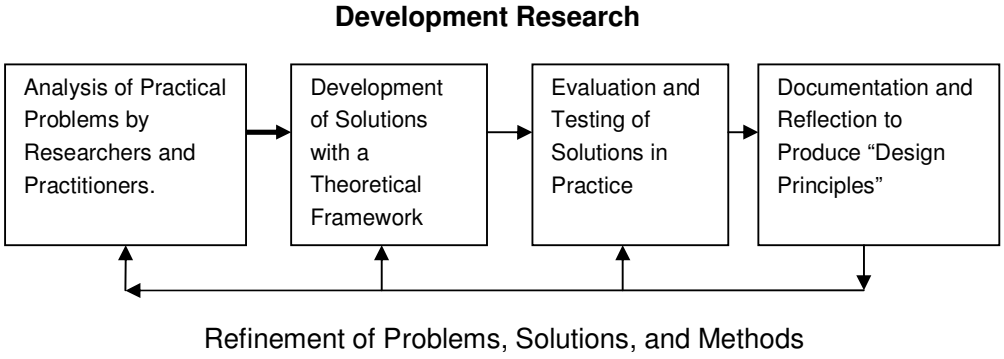
2.3 The research goal

Reeves and Hedberg (2003) contend that the identification of a research goal plays a crucial role in the selection of the research method. They state that there are six extensive categories of research goals: (1) theoretical, (2) predictive, (3) interpretive, (4) post-modern, (5) developmental, and (6) active. According to Reeves and Hedberg (2003: 271) developmental research is good at achieving two objectives; “developing creative approaches to solve human teaching, learning, and performance problems ….and constructing a body of design principles that can guide future development efforts”. This research study is developmental since it is aimed at creating a constructivist instructional design model to ensure best practices in the future e-learning development efforts of the South African corporate sector.

2.3.1 Developmental research

Seels and Richey (1994: 127) state that developmental research comprises of "systematic study of designing, developing and evaluating instructional programs, processes and products that must meet the criteria of internal consistency and effectiveness". Van den Akker (1999: 2) argues that traditional research approaches do not yield valid data to help improve the design of e-learning portals. He states that development research is better suited for instructional design because of its "cyclic, interactive and spiral" nature which generates opportunities for "successive approximation" and for more informed and developmental learning. This is in line with Reeves and Hedberg (2003) who see development research as synonymous with formative research which they say is particularly useful in solving human teaching, learning a performance problems. The development research model outlined by Reeves and Hedberg is depicted in Figure 1 below

Figure 1: Development approaches to research in learning technologies



Redrawn from Reeves and Hedberg (2003: 274)

Following the arguments raised by Reeves and Hedberg (2003: 273) I contend that this approach is suitable for this study as it:

- Addresses complex problems in the learning portal in collaboration with instructional designers and course facilitators
- Integrates known and hypothetical design principles with technological affordances to provide plausible solutions to the complex problems of introducing online learning to corporate learners
- Will conduct rigorous and reflective inquiry to test and refine an innovative learning environment through the use of an ID model.

In this context the study should provide "valuable incentives for sharpening theoretical insights" (van den Akker, 1999: 3); which will enhance the development of a learning design model specifically suited for the South African corporate sector.

A pragmatic approach was taken to collect data from a variety of sources. This provided an understanding of local needs which were compared with best practices from the literature reviewed. Thus leading to the development of a solution within a specific theoretical framework.

2.4 The research methods

Taking the four stages of Reeves and Hedberg (2003) development model as a guide, this study

- analysed practical problems through reviews of three e-learning courses using a pragmatic mix of educational expert reviews and case study methodologies
- developed a solution within a theoretical framework, outlined in the literature review
- evaluated and tested the ID model as a solution whereby the proposed model was sent to practitioners for evaluation and comment, and finally
- documented the proposed solution in terms of a reflection on the literature review and current practices.

A qualitative approach, with instructional design interviews, educational expert review forms and subject matter expert review forms was used as a primary means of data collection in reviewing current practices. According to Denzin and Lincoln (1998) qualitative research can comprise of ethnographies, case studies, survey interviews and historical and document analysis. The use of qualitative research gives people involved in the research study a chance to “construct their reality” and this is done through “highly detailed rich descriptions of human behaviours and opinions” (Savenye & Robinson, 2004: 1046). The data collection process involved the “setting of boundaries for the study”, collecting information through educational expert reviews, instructional design and subject matter expert review forms as well as in-depth interviews with practitioners in these fields (Creswell 1994:149).

This research study was conducted through the use of the developmental approach outlined by Reeves and Hedberg (2003) and van den Akker (1999) as well using elements of case study. The study was conducted within an Information Communication and Technology (ICT) company that designs e-learning courses for different companies. Three corporate learning portals developed by this company from the Insurance Sector Training Authority (INSETA) and one company in the Banking Sector Training Authority (BANKSETA) were interrogated to see if there is a match between the stated and the applied e-learning design methodology.

2.4.1 Data collection instruments

A combination of research tools were used to meet the research objectives, including

- Educational expert review forms: these are questionnaire styled forms that were formulated to guide the e-learning experts in evaluating the use of e-learning best practices in the design of the corporate learning portal
- Instructional design interview forms: these interviews were conducted with the instructional designers of the learning modules or portals. Their views assisted with giving a better understanding of their current instructional design practices and identifying the gaps thereof
- Subject Matter Experts review forms: whereby SMEs were approached for information on legislative and content selection processes with particular reference to South African requirements.

These were used to meet the research objectives as identified in Table 1 below.

Table 1: Tools used to meet research objectives

Objectives	Tools
Understand South African corporate training needs	Literature review, interviews with instructional designers and subject matter experts currently acting as practitioners in South Africa
The differences between training, education and academic learning and learning theory that best accommodates these differences and/or similarities	Literature review
To examine the academic e-learning best practices and the possibility of their integration into the ID model in the corporate sector.	Literature review and comparison with practitioner stated requirements.
To explore the Instructional /Learning Design models and how they can enhance e-learning in the corporate sector in South Africa.	Literature review and current practices through the interrogation of current courses and interviews with practitioners
To identify the general and legislative requirements for the development of e-learning portals of the South African corporate market.	Literature review and practitioner requirements as stated in interviews
Establish an understanding of e-learning in the corporate sector as it is currently practiced	Study of current courses with educational expert reviews of these courses.

The responses to the educational expert review forms, the instructional design and subject matter expert review forms were carefully studied and where information gathered was not clear or needed clarification, follow-up interviews were conducted.. The data collected was then used to develop a draft instructional design model for the South African corporate sector. After the development of a draft constructivist instructional design model education experts reviewed it, and made necessary changes when need arose. Formative evaluation of the ID model was made by asking practitioners to comment on how it could be used and if it would assist in their

practice. The responses were used to finalize the development of a South African corporate constructivist e-learning design model.

2.5 Rationale for the case study methodology

Although this study is not purely a case study, many of the tools and interrogation methods are drawn from case study methodologies. A case study is defined as a pragmatic enquiry that explores a "contemporary phenomenon within its real-life contexts" (Yin, 2003: 13), especially when the context and action interrelate to form an element of analysis (Yin, 1989; Stake, 1995; Henning, 2004). It is a broad term used for a "family of research methods with a common aim of focusing their inquiry around a case in point" (Adelman et al 1977 cited in Bell, 1993) and usually within a limited time frame (Stake, 1995). A case study within a developmental model was chosen for this research as it allows for the interrogation of some existing elearning developments and practices as its 'case in point' in order to extrapolate current practices and perceived needs from which an ID model can be developed.

According to Merriam & Simpson (1995) the strength of the case study approach lies in its ability to tender a large amount of rich, detailed data about the phenomenon under study whilst allowing a certain flexibility in approach.

2.6 Validity

Validity identifies if the data collection tools measure what they are supposed to measure (Yin, 2003). In this study multiple data sources were used to triangulate qualitative information and better understand the 'real world' development processes. The outcomes of this research may not be fully representative of all development in South Africa, but the trends identified and the developed product should be usable for most e-learning development in the region. It was not possible to use quantitative statistical data analysis as the sample size was too small.

2.7 Sampling and sample size

Four e-learning experts from academic backgrounds reviewed current learning portals developed for three different companies. In addition three company based instructional designers were asked to answer the questions regarding their design processes, and three subject matter experts (SME) were approached for information on legislative and content selection processes. Although the sample size is small and the participants were drawn from a limited number of accessible groups they represent practitioners in different sectors of corporate South Africa and their experiences showed trends that could be extrapolated into the broader e-learning community. It must be mentioned that the choice of companies was purely pragmatic in that they were receptive to the idea of taking part in this research. It is extremely

difficult for an “outsider” to gain access to corporate records and these companies are thanked for their willingness to participate.

2.8 Data analysis procedures

Data analysis was done through the use of QSR NVivo 7 qualitative software. Where there is less data, manual thematic analysis was used to generate categories and the emerging themes.

2.9 Data presentation and dissemination

Data is presented in a descriptive or narrative form and where necessary graphics are used to highlight a point or make for easier visual representation. The research report highlighted by Reeves and Hedberg (2003) takes the form of this dissertation however; on completion participating companies will be given an “executive summary” of the findings and offered copies of the dissertation. In addition they have been offered the rights under Creative Commons Licensing agreement to use and modify the model developed.

2.10 Ethical considerations

Ethical clearance (HSS/0655/07M) was obtained from the relevant university committees (Appendix A) provided that informed consent (Appendix B) was obtained from all participating individuals and they were informed that they could withdraw from the research at any time. The ICT Company designing the learning portals were assured that their company names would not be identified without prior written consent. The participating companies were also guaranteed that the study was done on the ‘first do no harm’ principle. All the participants in this research study were fully informed on the process and the benefits of the study; they gave written consent and were free to withdraw if they felt uncomfortable with the study. Involvement in this study carried no financial benefits but it is hoped that the ID model developed will be of benefit to the participating companies.

2.11 Conclusion

This chapter has outlined the research paradigm and methods that advised the process of this research. As advised by Reeves and Hedberg (2003) any developmental research should be conducted within a theoretical framework that advises the solutions sought. Under the heading “Literature Review”, the next chapter outlines the current legal requirements for South Africa’s corporate sector training, looks at best practices recommended by other researchers and reviews instructional design models that influenced the development of a solution for South African corporate needs.

Chapter Three: Literature Review

3.1 Introduction

The literature review highlights the theoretical framework that informed the design of instructional design model and the specific issues other researchers have identified for best practices in e-learning. It starts by contextualizing the historical and legislative requirements in South Africa, moves on to documenting researched best practices and issues that should be considered when developing useful accessible e-learning courses. It then looks at various ID models that could be adapted for use in the local corporate sector.

3.2 Introduction to South African corporate training

After the installation of the democratic government in 1994, the Department of Education deliberated on issues of transformation in education and training. This culminated with the publication of the White Paper on Education and Training in the Government Gazette (Vol 357 No. 16312). Of particular importance in this research it is noted that the new democratic educational approach was based on the concept of life-long learning (Republic of South Africa, 1995). The Insurance Sector Education and Training Authority (INSETA, 2008) website outlines the following benefits of life-long learning

- the learner becomes adaptable and change-worthy, i.e. constant change no longer a threat
- the learner becomes continually employable, and marketable because of learning new job skills
- the learner can expand his/her work/professional credentials to which broadens experiences and prepares them for career transitions
- the learner can prepare to obtain formal qualifications
- the learner can network with other learners who have similar goals and experiences
- the learner can challenge personal standards for excellence to reach new levels
- the learner can discover insights into how to make personal and professional life more efficient, effective and enjoyable
- the learner can develop new interests by simply trying something new
- the learner can keep motivated when life gets a little overwhelming
- the learner can fulfil personal and professional aspirations.

In 2000 the government, through the Department of Labour, regulated that the Sector Education Training Authorities (SETA) would have to apply to the South African Qualification Authority (SAQA) for permission to execute the Education and Training Quality Assurance (ETQA) duties within the specific sectors. SAQA then “assists in the fast-tracking of applications for accreditation to protect the learners in the ‘set-up’

phase" (SAQA 2003: 01). The SETA performs the following functions (SAQA 2003: 02)

- accrediting providers
- promoting quality amongst constituent providers
- monitoring provision
- evaluating assessment and facilitating moderation among constituent providers
- registering assessors
- the certification of learners
- co-operating with relevant moderating bodies
- recommending new standards or qualifications to National Standards Bodies (NSB) or modifications to existing standards and qualifications
- maintaining a database
- submitting reports to SAQA.

According to Moolman (2006: 14) in May 2004 the ICT Charter was drafted warning that South Africa's worldwide position in terms of the provision of skilled labour had dropped from 97th to the 107th. This drop exists even though a forceful National Skills Development Policy is in place. The ICT Charter argues that "only ten percent of companies really promote and implement empowerment of their employees" and further called upon all companies to develop their employees to enable them to "adapt to modern job demands" (ICT Charter, 2004 np).

The different South African legislative acts that promote enhancement of local employees (Moolman, 2006:14) are

- Employment Equity Act 55 of 1998, which strives to promote equity in the workplace; this provides a strategy to develop and improve the skill-base of the SA workforce by addressing imbalances in terms of race, gender and people with disabilities
- Skill Development Levies Act 9 of 1999, which obliges "employers with an annual payroll of a set amount (with certain expectations) to pay a Skills Development Levy (SDL of 1% of payroll)" (Fasset, 2008)
- Preferential Procurement Policy Framework Act 5 of 2000, which encourages organisations to award contracts in a free and fair manner, and
- Broad Based Black Economic Empowerment Act 53 of 2003, to promote economic transformation (ICT Charter, 2004).

3.2.1 The government skills development incentive

Of particular importance to many of the developers of learning in South Africa the government legislation in terms of the Skills Development Levies Act requires the payment of the levy grant scheme. This scheme is enforced in order to enhance the expansion of knowledge and competencies in the labour force which will lead to an upgrade in employment and production. Employers who partake in the levy grant

scheme by facilitating the development projects within their companies will have better skilled and more productive employees and get a refund on their development expenses.

It is against this legislative backdrop that this study was conducted. It identifies which best e-learning practices are currently used. It highlights the best practices that are being overlooked. Finally, it uses this information to develop a constructivist instructional design model to assist the corporate sector in South Africa design acceptable and accreditation compliant e-learning courses

3.3 Training, education and academic learning

Training, education and academic learning as highlighted by Willingham (2006), Ogle (1997) and Laurillard (1993) forms the conceptual framework for this study. This section aims to draw the attention of the skills developers in the corporate sector to refrain from 'training' the workers but to incorporate 'education' and 'academic learning' in their skills development strategy.

Urdan and Weggen (2000: 91) define training as the "act of teaching or learning new information, behaviour, skills, or actions that can be used to perform job-specific tasks or improve performance". The attainment of this simple job-specific 'hands-on' skills is of a short term benefit to the corporate sector. In contrast, equipping the workers with both theoretical and practical skills that are imparted through the use of the 'education and/or academic learning' approach could enable the workers to be critical thinkers which could benefit the corporate sector on a long term basis. The workers should be able to achieve the theoretical and practical skills through the use of 'field dependent' (0gle 1997:1) or authentic activities. Laurillard (1993:18) stresses the significance of authentic activities by saying that it "gives the learner a chance to apply their conceptual knowledge in the workplace". Jasinski (1998) enumerates eight defining principles that education should comprise of so as to ensure that the market demand in the knowledge economy is assured. These are lifelong learning; learner-directed learning; learning to learn to plan and realise your own learning; contextualised learning; customised learning designed to meet different needs, preferences and cultural practices; transformative learning enabling the changing of the belief systems to overcome disability and disadvantage; collaborative /co-operative learning and just-in-time learning allowing the individuals to choose from the global presented opportunities. The interrelation between training, education and academic learning can be identified in Table 2 below:

Table 2: Differences between training, education and academic learning

Training	Education	Academic learning
Practical	Theoretical	Multiple contexts
Field-dependent	Field-independent	Field-independent
Narrow-based	Broad-based	Narrow-based
Hard skills	Soft skills	Intellectual skills
Specific amount of time	Lifelong	Prescribed duration
Tangible	Abstract	Abstract

(Ogle 1997:1)

Willingham (2006: 2) states that "behavioural change in people leading to success in companies should involve training, education, practice, reporting, rewards and coaching" thereby promoting the assimilation of education and academic learning into the corporate sector skills development strategy. Laurillard (1993:13) and Amory (2006:2) argue that it is important to change the practice of teaching when using advanced computer mediated communication (CMC) technologies, stating that CMC calls for the use of a learner-centred approach which promotes interaction, problem-solving and the use of authentic tasks to enhance understanding.

The use of training, education and academic learning as a skills development and learning strategy in the South African corporate sector could enable the workers to learn through experiencing the already available knowledge of the world via "second-order experience" which tackles both the "direct experience and the reflection on that experience" (Laurillard 1993: 25). This suggested learning strategy together with the user learner-centered approach as advocated by Amory (2006) and Laurillard (1993) will lead to the use of constructivist learning approach when designing learning.

3.4 Constructivist learning approach

The constructivist learning approach supports the use of authentic activities in the learning process. This theory has grown from the ideas expressed by Lev Vygotsky (1978). One of its core elements is based on the concept that knowledge is socially constructed and that learners approach any situation with their own prior experiences and concepts that should be recognized and acknowledged in the learning process. Resta (2002: 25) defines a constructivist environment as one that encompasses communities of students, teachers and experts who

1. perform authentic tasks in authentic contexts which relates to work done in the real world
2. provide opportunities for learners to experience multiple perspectives
3. enable the learners to see issues and problems from different points of view, to negotiate meaning and develop shared understandings with others, and

4. emphasize authentic assessment of learning rather than the traditional paper and pencil test.

The learning process may challenge the learners' prior knowledge and conceptions, assimilate new knowledge into this existing understanding and create a framework whereby new understanding can be applied in the work place. Gold (2001) reasons that this construction of knowledge requires learners to go through an active period of thinking critically about any given task which can be facilitated by interaction with peers, conducting some form of research on electronic and paper-based media and critical review of the work of peers.

The constructivist theory proposes that every learner should be in a position to regulate their own learning process, in that they should be conscious of what they comprehend and the way they form their perceptions (Tapscott, 1998; Resta, 2002). Resta (2002:19) outlines seven elements that constitute the constructive learning process; (1) learning as a natural process, (2) learning as a social process, (3) learning as an active and not a passive process, (4) learning as linear or non-linear, (5) learning as integrative and contextualized, (6) learning as based on a strength model of student abilities, interest, and culture, and (7) learning as assessed through task completion, products, and real problem-solving of both individual and group efforts. Constructivism is context dependent rather than content dependent and focuses not on the content or its objectives, but on the diverseness and richness of the learning environment, skills and competencies (Greening, 1998).

While this research does encourage the use of key elements within the constructivist methodologies, it also recognises that some corporate training may require direct instruction. However in order to engage learners in the diverse aspects of South African cultural realities an inclusive social construction of knowledge may lead to longer term benefit than a module mastery computer based instruction approach.

3.5 Best e-learning practices

Correctly used, the communication technologies available on the internet allow course facilitators to engage their learners in many of the social and authentic activities highlighted by constructivism.

3.5.1 E-learning theory

According to Innoelearning (2003: 02) e-learning comprises of variable applications such as web-based learning, computer-based learning, virtual classrooms, and digital collaborations. They define e-learning as "internet-based learning that is focused on the delivery of content (text, audio, video, animation, and simulation) in a training format". Nichols (2003: 04) argues that e-learning includes "digital materials storage and distribution (presentation); synchronous and asynchronous communication,

simulative interactivity, multimedia and access tracking (processes) − each of which is subject to multiple applications of use and innovation". He goes on to argue that e-learning is a means of education delivery but not a mode of education. Nichols asserts that e-learning can be used with any learning model and educational philosophy. E-learning can be used to allow the learners to construct their own knowledge and the learners can make use of e-learning to present what they have learnt. This can be done in the form of multimedia presentations, uploading of electronic files for peer review, discussion forums and wikis to be viewed and commented on by the people with access to the course. In this way Nichols (2003: 03) says that e-learning allows some form of "educational convergence".

3.5.2 Eight areas of e-learning best practices

Trivedi (undated) in her study on the best practices of an online learning environment conducted at the College of Technology, University of Houston outlines eight areas that contribute towards the accomplishment of e-learning best practices.

1. Course planning preparation:

According to Trivedi (undated: 1) and Cyrs (1997) there is a need to be highly cautious when planning and preparing online learning. Cyrs (1997) mentions four elements that form the best practices in online course design, namely: paying attention to pertinent issues like "copyright issues, delivery systems, instructional strategies and effective use of available technologies". Tracey and Richey (2006: 374) in their study on the use of models for multiple intelligences mention the importance of determining the e-learner's needs as part of the course planning and preparation, as also stated by Trivedi. Innoelearning (2003: 13), in their study aimed at fostering innovative self-learning for work in Europe, also stress the importance of preparation before the e-course by conducting a 'skills gap analysis'. A skills gap analysis helps inform the course designer on what skills the learners need most, in this particular case the corporate learners need to have specific accreditation in order to qualify to provide their specialised services to the public.

2. Technical infrastructure and support:

Like Tracey and Richey (2006), Trivedi (undated) argues that it is best practice to have a clear idea of how you want the online course designed and delivered. This has to do with the 'technical infrastructure'; it is desirable to install hardware and software which does not require the users to have extra plug-ins and advanced computer knowledge. Trivedi (undated) mentions five technical elements that should be checked to ensure e-learning best practices

- proper network connections
- reliable server

- traceable data backup methods
- applicable software
- well-functioning hardware.

3. Instructor/facilitator training:

It is crucial that the course instructors are well trained in both the content matter and the theory and practice of online learning. Trivedi (undated: 3) states that the online instructor needs to be prepared to facilitate collaboration and discussion amongst the e-learners, while Innoelearning (2003: 13) emphasise that a knowledgeable tutor should always be available to provide intellectual guidance to the learners. Meyer-Peyton (2000) in Trivedi (undated: 3) asserts that adherence to the e-learning best practices guarantees the improvement in skills hence high competency levels.

4. Initial online class meetings/orientations:

The South African corporate sector has recently started making use of web based learning for training and learning purposes. Therefore it is important to have an introductory session where the e-learners get initiated to online learning (Trivedi undated: 4). The orientation session would provide the e-learners the chance to be introduced to log-in and other procedures and allow the e-learners to ask questions and get clarifications on the modern learning methods. Innoelearning (2003: 14) argues that orientation is important because it gives the course facilitator an opportunity to alert the learners to the objectives of the course and how the course will benefit them. When corporate e-learners are compelled by the company and the government regulations, the orientation could be used to instil responsibility and commitment to perform and gain accreditation. The orientation session also helps the e-learners to bond with each other. If the learners are far apart from each other the orientation can be done online with each participants encouraged to give background information about who they are, their education and work experience and if they have ever had any exposure to online learning or the course under study. This introductory session could be used to establish the learners' identity and prior knowledge.

5. Diversity of instructional material:

Due to the learners' different learning styles and preferences, an online course should have a variety of learning materials, in the form of text, graphics, animation and audio (Cooper, 2000: 04). Innoelearning (2003: 14) argues that the e-learners should be encouraged to make use of digital tools to submit their tasks. The integration of learning content with digital tools like PowerPoint presentations, electronic portfolios of evidence and online quizzes, can create interest and keep the e-learners motivated to learn (Innoelearning 2003: 14).

6. Course structure:

As in paper-based learning materials where the material is divided into chapter, topic, sub-topic and assessment tasks; Cooper (2000) as well as Harrison and Bergen (2000) stress that courses should be divided in terms of weeks, topics, days, units and lessons and have appropriate assessment to assist the learners in assessing their knowledge construction levels. Innoelearning (2003:14) also states that there is a need for proper document management where the learning material is well organised and displayed in the online learning portal, with prescribed material and supporting secondary materials clearly marked. Innoelearning (2003: 14) goes on to stress the importance of allowing the learner to regulate their own learning by providing the necessary information. Learners have different learning styles and paces; therefore they should be given a chance to work according to their own schedules as far as possible. Deadlines should be clearly displayed such that all the e-learners can budget their time effectively.

7. Student assessment:

According to Cooper (2000), assessment forms an integral part of any course. Harrison and Bergen (2000) state that there must be formative and summative forms of assessment to ensure that the learners' performance is captured in an effective and traceable form. They argue that to avoid cases of learners getting other people to write online exams for them, a reliable proctor should be located in residential areas. After the assessments have been completed, a proper accreditation or certification should be in place to avoid fake certification being issued in the name of the institution or the specific trainer. Innoelearning (2003: 14) argues that e-learners should be allowed to keep an eye on their performance and have a chance of undertaking formative assessments repeatedly until they have a better understanding of the phenomenon under study. These formative assessments can be in forms of puzzles, specific tasks after every section and after a chapter, involvement in discussion forums and assignments leading to a summative graded portfolio.

8. Course evaluation:

Reeves (2003) and Cooper (2000) agree on the importance of evaluating the course. According to them it is always best to perform a formative evaluation, effectiveness evaluation and the summative evaluation. These types of evaluation should be aimed at evaluating the online learning portal's usability, the learning material and the facilitation process, to check if any aspects of the course need improvement. Cooper (2000) stresses that for online learning to be effective, there should be open and ongoing communication between the course facilitator and the learners and between the learners themselves, to ensure course usability. However, it is also important to acknowledge that courses will need to change over time and that the ‘summative’ evaluation occurring at the end of one course, or at the end of the initial development

of a course, simply means modifications may be necessary before the next course is run. Course evaluation is never 'complete' and course adaptation is perpetually iterative. This is of particular relevance to external course developers who need to "complete" a development and sign it over to a particular company.

3.6 Instructional design

The strategies for ensuring best e-learning practices outlined above can be applied in a flexible instructional design model. There is some controversy in the use of the term 'instruction' within "instructional design". Some practitioners argue that in the light of constructivist educational theory with an emphasis on interactive, learner-centred learning and authentic activities the term should be "learning activities design". The term 'instruction' originated from the behaviourist approach to learning where the teacher played the role of instructing or transferring knowledge to the learners. Jonassen (1994) states that, in the past, instructional design was objective in nature; it predetermined both the outcomes and the learning processes to form a concrete concept of reality in the learner's mind. However, although the intention of this study is to develop a model based on constructivist educational principles, the term "instructional design" is still used as it is commonly understood by educators and particularly educators in corporate environments, as a way of guiding course development without presuming the use of a particular educational paradigm.

The development of an instructional design model, here, is based on the definition of the term 'instruction' as an approach to learning that recognises the validity of unpredictable learning outcomes (Jonassen, 1994). It acknowledges that learning takes place through interaction amongst peers and the use of authentic learning activities, supporting Jonassen's (1994) argument that a constructivist design process should be concerned with designing environments which support the learners own construction of knowledge.

There are various definitions of instructional design which essentially cover the same issues. For instance, Siemens (2002) defines instructional design as "the carefully organized, detailed and articulated plan for producing learning environments". According to Siemens (2002:02) instructional design is the "system or process of organising learning resources to ensure that learners achieve established learning outcomes" (Siemens 2002: 02). Similarly, Piskurich (2000) describes instructional design as a process of creating efficient training through a system that assists in conducting appropriate assessments leading to competent learners with life-long problem solving skills. According to Piskurich (2000:03) instructional design can be defined as "a set of rules, …procedures for creating training that does what it is supposed to do", where he emphasises assessment. Rossett's (2004) definition contends that instructional design is the process by which design, development, implementation and evaluation of a learning website is carefully planned to ensure

that the users find it easy to use for learning purposes, laying the emphasis on the learners' needs. Wilson (1997), however focuses on the research aspects and sees the theory of instructional design as a means that can facilitate the process of reflection on design problems, the study and research questions and the sharing of the knowledge within the instructional design group.

3.6.1 The instructional principles derived from the constructivist approach to learning

Savery and Duffy (1996) state that instructional design principles have to be adhered to, in order to ensure learners enjoy an effective e-learning experiences. They go on to prescribe 8 instructional design principles that every learning designer should incorporate into their course design as discussed below.

1. Anchor all learning activities to a larger task or problem: For effective learning and understanding learning activities must be designed with a purpose to enable the learners to function competitively in a holistic manner.

2. Support the learner in developing ownership for the overall problem or task: Every learning programme should have specific learning objectives that also aim at facilitating the learner to comprehend the learning task. The learning programme should also enable the learner to identify with the learning content and be able to produce solutions that are beneficial to the problem at hand. Savery and Duffy (1996: 04) suggest two ways that can make the learner belong to the learning programme, that is "soliciting learning problems from the learners and using these problems as the stimulus for learning activities". Oliver and Herrington (2001) also agree with this notion by saying that learning activities should enable learners to get actively involved and engaged in the learning process. E-learning offers learners tools for engaging in their learning like the peer review tool, and the discussion forum tool.

3. Design an authentic task: Authentic tasks are tasks that are suitable for all age groups, have a relation to the daily environment of the learner, and make him/her more capable of solving real life problems. These types of tasks are relevant to the way people live; they could relate to their cultural beliefs, and their values. Mueller (2006) also sees authentic tasks as tasks that give learners an opportunity to create their own responses rather than simply selecting from the preordained ones. Instead of seeking to know what the learners know or what they can recall, authentic tasks require the learner to read, think critically about what they have read, explore, create and put their knowledge into use in a real life situation. Ten guidelines for authentic activities (adopted from Reeves, Herrington and Oliver, 2002) are that authentic activities

- have real-world relevance
- are ill-defined, requiring students to define the tasks and sub-tasks needed to complete the activity
- comprise complex tasks to be investigated by students over a sustained period of time
- provide the opportunity for students to examine the task from different perspectives, using a variety of resources
- provide the opportunity to collaborate
- provide the opportunity to reflect
- can be integrated and applied across different subject areas and lead beyond domain-specific outcomes
- are seamlessly integrated with assessment
- create polished products valuable in their own right rather than as preparation for something else, and
- allow competing solutions and diversity of outcome.

4. Design the task and the learning environment to reflect complexity: Savery and Duffy (1996) argue that learning should not be designed to simplify the process of learning but to ensure that learners get support in their multifaceted work setting.

5. Give the learner ownership of the process used to develop a solution: According to Savery and Duffy (1996) this can be achieved through presenting learning activities that challenge or test the learner's thinking abilities. They warn the course designers and facilitators against "dictating or proceduralising" the learner's thinking.

6. Design the learning environment to support and challenge the learner's thinking: This calls for careful and accurate choosing of the right activities and correct articulation of desired solutions that enhance the learner's thinking capacity. Savery and Duffy (1996) state that to achieve these in the learning process the course facilitator should be well equipped to play the coaching and scaffolding (Vygotsky, 1978) role.

7. Encourage testing ideas against alternative views and alternative contexts: Thirteen Ed Online (2004) term the sharing of alternative views and contexts collaborative learning. The learning designer has to ensure that the e-course allows the learners to 'explore significant questions and create a meaningful project' (ibid). This way of learning gives the learners an opportunity to gain from each other's strengths and expand the other learner's weaknesses.

8. Provide an opportunity for and support reflection on, both the content learned and the learning process: The learning design should afford the e-learners space to reflect on their personal development both in terms of content and the learning process in general. Clift, Houston and Pugach (1990) state that the course

facilitator should use their facilitation to mould insightful thinking and allow the learners to evaluate their learning process.

3.6.2 Advantages of Instructional Design

Piskurich (2000: 05) mentions seven rewards of using instructional design principles correctly. These are

1. Cost effectiveness: Piskurich (ibid) argues that using ID to design training helps the company focus on specific needs and thereby reduce overall training costs.

2. Time effectiveness: According to Piskurich (ibid) instructional design can assist the trainer to meet the training needs of the target audience. This is made possible by the needs analysis that is done before designing the course and the different analysis that take place during the design, implementation and the summative analysis stages.

3. Learning effectiveness: When designing learning it is important that one is familiar with both the learning content and the learners' context. This assists the instructional designer in making the right decision on what the learners need to learn and how it should be structured to facilitate their understanding.

4. Training effectiveness evaluation: Piskurich (2000: 08) argues that "through the use of instructional design procedures, you will create objectives for the course that you can use as the basis of evaluation, determining which objectives the trainees have met". There are three types of effectiveness that need to be looked at with regards to ID, that is cost, time and learning effectiveness. The abovementioned factors become easy to evaluate because of the overall, site management, user management and course management features which can be incorporated into the instructional design of any course.

5. Competitive advantage: It is an advantage for any company to have a good training policy and well trained employees. This is particularly important in South Africa as the government regulation through the Sector Education and Training Authorities (SETA) require all employees acquire training to qualify them to work in their fields of specialisation.

6. Business integration: The proper use of instructional design would assist the training provider keep track of an organization's progress. Piskurich (2000:09) says that if the ID process is instigated early, the evaluation of training in terms of meeting the company's objectives, "visions and goals" is easily achieved.

7. Consistency: Using the ID principles for course design makes it possible for the delivery of learning to be consistently of the same quality. Shackelford (2002: 91)

suggests that instructional designers should “develop estimated guidelines for existing course page templates (style sheets) and create any new templates that may be required”. Piskurish (2000) argues that the use of design templates ensures the quality of training becomes constant; this means that all the trainers in different locations use the same material, laid out in the same way and follow the same course schedules.

De Lisle (1997) states that the instructional design theory assists the instructional designers with guidelines on how to overcome any problems that might arise during the systems design process. Dick, Carey and Carey (2005) also state that using an instructional systems design model for the designing of learning enables the learning facilitators to account for the learning objectives and what has been learnt.

3.6.3 Disadvantages of Instructional Design

Piskurich (2000: 09) states the two disadvantages of instructional design are that it is time consuming and it requires more resources to put together. He counters this by stating that using, and following, instructional design principles will minimize the disadvantages. Designing a course for online learning requires the collaboration between the Subject Matter Expert (SME), the instructional designer, the instructor, educational/pedagogical reviewers and some users. They should collectively test and evaluate the course prior to its launch.

Kanuka (2002) warns that content experts who have teaching experience will have instructional strategies that differ from instructional designers. He recommends that instructional designers and the pedagogical content experts work together.

3.7 Instructional strategy

The instructional strategy is the approach used to present information in a manner that facilitates learning. According to Dick and Carey (1996) instructional strategies play the role of describing the broad components of the learning materials to draw out specific learning outcomes from the learners. Saskatchewan (1988: 3) argues that instructional strategies can be “direct (e.g. lecture, didactic questioning, explicit teaching, practice and drill and demonstrations), indirect (inquiry, induction, problem solving, decision making and discovery), interactive (discussion and sharing among participants), experiential (inductive, learner centred and activity oriented), or independent (instructional methods to enhance individual initiative, self-reliance and self-improvement)”. According to Saskatchewan (1988) “some aspects of instructional strategies include the order of presentation, level of interaction, feedback, remediation, testing strategies and the medium used to present the information”. Reigeluth (1987) sees the instructional strategy as three dimensional. The first dimension is the organisation of learning material which deals with scaffolding; the second is the learning content delivery which deals with the

presentation of the content; and the last one, is the learning management which deals more with the administration and assessment.

Saskatchewan (1988), Ekwensi, Moranski & Townsend-Sweet (2006) and Dagada & Jakovljevic (2004) stress the importance of amateur instructional designers basing their instructional strategy on the results of the needs analysis, and the desired learning outcomes. They argue that this will prevent the instructional designer from repeating the same mistakes made by others 're-inventing the wheel' which could cost the company more time and resources.

Ekwensi, Moranski & Townsend-Sweet (2006: 2) present ten effective e-learning instructional strategies: one-on-one mentorship, forum, small group work, projects, collaborative learning, case study, learning contracts, discussion, lecture and self-directed learning.

1. One-on-One Mentorship

In this instance the mentor avails the learner with ongoing support, advice and direction. He also becomes the role model, advocate, sponsor, adviser, guide, developer of skills and intellect, listener, coach, challenger, facilitator, and resource provider through one-on-one interaction. This instructional strategy can be used through tools such as e-mail and real-time chat. It can alleviate time and place commitments that are required in face to face meetings and the people involved can still develop a one-on-one learning relationship with one another (Ekwensi, Moranski & Townsend-Sweet, 2006: 2).

2. Forum

A forum comprises open online discussions by one or more resource people and an entire group on issues of common interest (Ekwensi, Moranski & Townsend-Sweet, 2006). The forum allows the online discussion participants to "raise and discuss issues, make comments, offer information, and /or ask questions of the resource people and each other" (Instructional Strategies for Online Courses, 2006). Shimabukuro (2000) argues that forums can be "delivered via video conferencing, discussion board or e-mail". For a forum to take place effectively there needs to be an interaction between a facilitator and learners as well as between learners. Forums can be both asynchronous and synchronous and thus they offer flexibility for the participants in terms of times and groups.

3. Small group work

According to Ekwensi, Moranski & Townsend-Sweet (2006) small group work is an effective instructional strategy that can be used in an online platform for both the corporate and educational setting. They vouch for the effectiveness of this instructional strategy because it presents the online learners with a classroom setting where a small group of learners work together to achieve a specific task. Group work

assists learners to collaborate (share ideas), think on their own, use role-play to enhance their understanding, and increases the learners' ability to organize and manage their thoughts. They (ibid) go on to argue that group work dynamics fortify the learners' decision-making skills and assists them become more effective communicators.

4. Project

Projects can be done individually or in a group format, it is beneficial when the projects can be uploaded on the learning portal for the whole class to review. When the instructor and the learners give feedback on all the class projects, the class members get a wide range of "honest feedback which aids them in their future projects" (Ekwensi, Moranski & Townsend-Sweet, 2006). Group projects can take the form of case studies and simulations.

5. Collaborative learning

Collaborative learning is made up of an interaction between two or more learners. According to Ekwensi, Moranski & Townsend-Sweet (2006), collaboration happens better when the group members have different skill sets, they argue that the learners different learning abilities enable the learners to learn from each other (peer-to-peer learning). Saskatchewan (1988) terms this instructional strategy the co-operative learning group which he describes as an essential interactive learning method.

6. Case studies and simulations

Ekwensi, Moranski & Townsend-Sweet (2006) are of the view that the case study instructional strategy should be created around the learners' prior experiences and what they learn should be of practical importance to their future. A case study teaches the learners to be critical thinkers who are able to use the specific examples to create new knowledge that relates to the new circumstance. Simulations typically "present or model the essential elements of real or imaginary situations" (Saskatchewan 1988: 26) which, Dagada and Jakovljevic (2004: 199) argue, give the learner an ability to 'comprehend' the learning content through involvement and interaction enhanced by the online learning tools present during the learning process.

7. Learners' contracts

According to Ekwensi, Moranski & Townsend-Sweet (2006), the learning contract is a very valuable document in the e-learning environment as it shows the learners' commitment to fully participate in the e-learning process. Saskatoon Public Schools (2004) is of the view that learning contracts should be used as a method of individualizing instruction (learning activity) and developing learner responsibility. This instructional strategy also requires the learning facilitator to provide the learners with learning objectives, a clearly identified choice of resources and set clear learning task deadlines. In some circumstances, advanced learners are given an opportunity to set their own learning objectives.

8. Discussion

According to Instructional Strategies for Online Course (2006) discussion is the most favourable instructional strategy because it is “interactive and encourages active, participatory learning”, Ekwensi, Moranski & Townsend-Sweet (2006) highlight the importance and effectiveness of discussion by saying that “talk is cheap and effective”. Schone (2007: 5) asserts that “engaging interactions are necessary because they are more likely to keep learners interested and mentally stimulated during a learning experience…they will have a higher likelihood of recalling the information and transferring it to a real-world setting”. The online tools that can be used to facilitate the discussion instructional strategy are discussion boards/forums, listservs and online text conferencing. Herring (2002) says the advantages of using these communication tools (or newer forms of social networking such as Facebook and Twitter) are advantageous for learning purposes as they

- build on interactivity
- build a learning community
- enhance the learning process
- assist with knowledge construction.

9. Lectures, tutorials and drill and practice

The traditional lecture instructional strategy is facilitator-centred and does not allow for maximum interactive learning. According to Ekwensi, Moranski & Townsend-Sweet (2006) the lecture instructional method can work to provide a base upon which learners can build and it is more effective when combined with other instructional strategies.

Tutorials are usually done in the form of presenting information to the learners, asking them questions, assessing their responses and providing them with feedback regarding their performance. Tutorials assist the slow and fast thinking learners to retain the learning content through the ‘drill and practice strategy; problem solving; problem analyses and learning assessments’. In an online environment this can be automated in a quiz type format but also done through discussion forums, wikis and peer review.

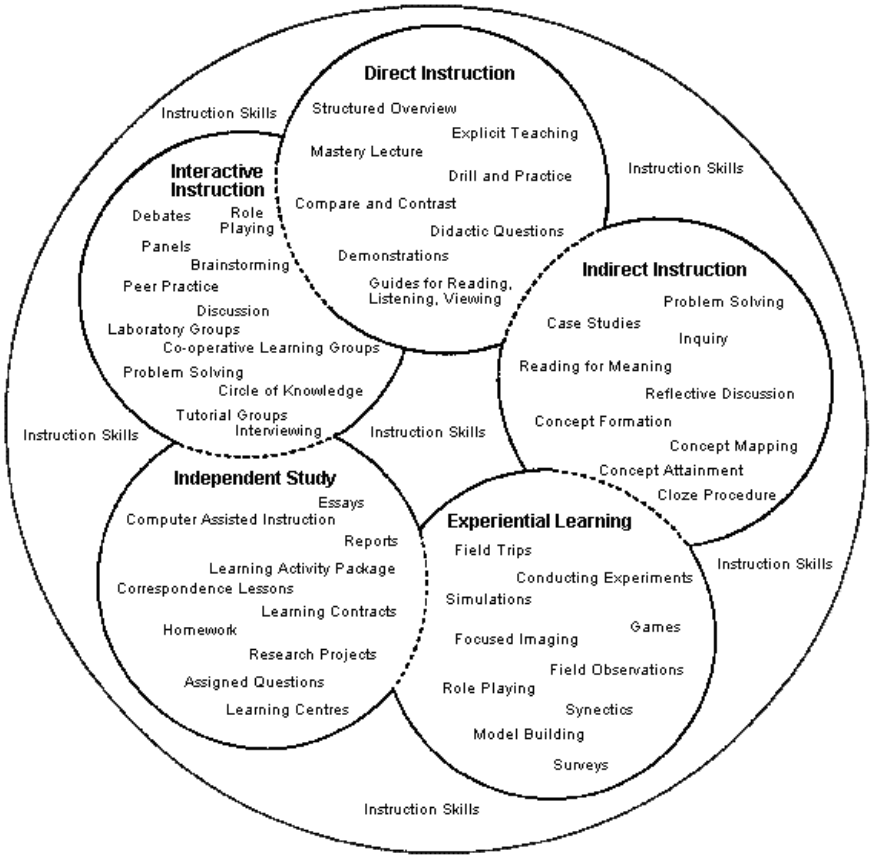
Drill and practice is a teaching and learning strategy whereby the learning content is “repeated and practiced” with an aim to achieve mastery. Drill and practice has to take place after the learning material has been taught, it works for learning language, facts, and problem (mathematical) solving. Not all learners manage to master the learning material at the same pace but repetition could assist the slower learners who learn from repetition and practice. Drill and practice can be made more interesting by introducing visual materials, sound, animations and creating competition amongst learners and informing learners of their progress

10. Self-directed learning

This instructional strategy allows the learners to define their own learning which results into a very effective learning process and facilitation of deeper understanding of the material (Ekwensi, Moranski & Townsend-Sweet, 2006). Instructional Strategies for Online Course (2006) defines self-directed learning as the "learning initiated and directed by the learner…include[s] self-paced, independent, and individualized learning as well as self-instruction".

Figure 2 groups various learning tasks according to instructional methods and can be used to inspire instructional designers who wish to accommodate different learning styles.

Figure 2: Instructional strategies



(Saskatchewan, 1991: np)

3.8 Instructional design models

According to Gros, et al. (1997), an ID model's objective is to make a connection between learning theories and the development of instructional design processes. Tracey and Richey (2006: 96) give six core elements that make an effective ID model:

- Determination of learner needs, problems identification, occupational analysis and competence or training requirements
- Determination of goals and objectives
- Construction of assessment procedures
- Designing and selection of proper delivery approaches
- Trying-out of instructional system
- Installation and maintenance of the system

There are two types of ID models; the conceptual and the procedural model.

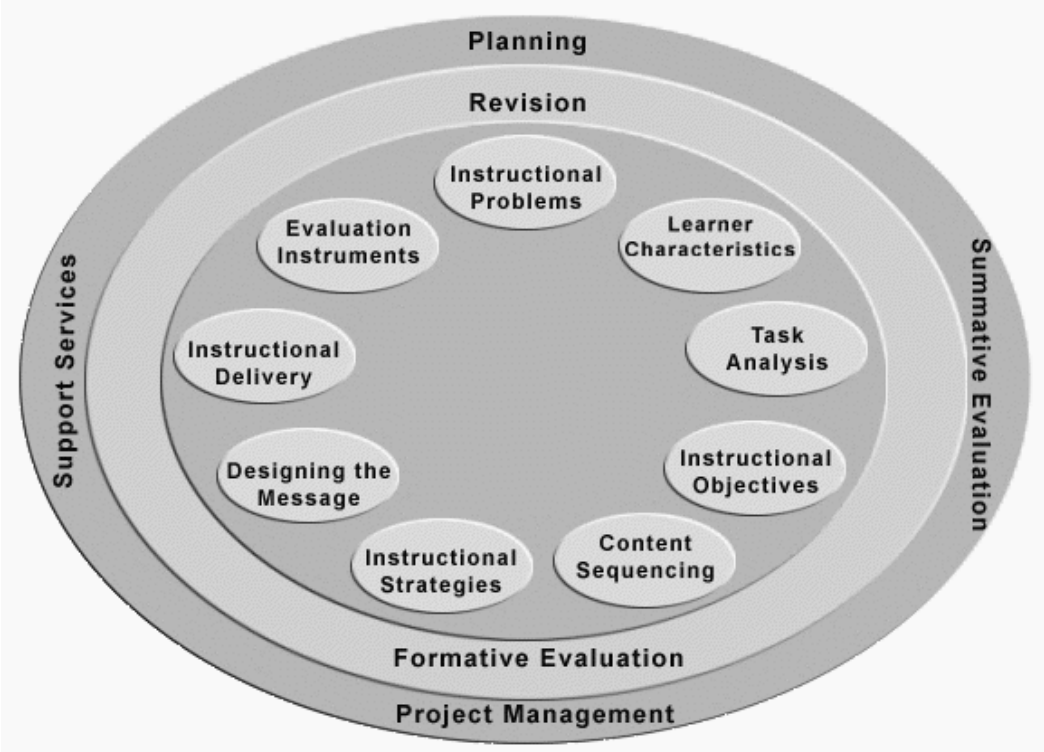
3.8.1 Conceptual instructional design models

The conceptual model is 'descriptive and experience-based' (Richey 1990: 124). She states that conceptual models 'facilitate an understanding of those factors which impinge on designs and their implementation' (Richey 1990: 131). The conceptual model 'encompasses current knowledge, and it is flexible enough to permit the assimilation of new knowledge whenever possible'. Some examples of conceptual ID models are discussed below.

Morrison, Ross and Kemp model [MRK]

Kemp, Morrison, and Ross (1998) argue that the MRK model (depicted in the figure below) allows the instructional designer some flexibility when designing for learning.

Figure 3: Morrison, Ross and Kemp model



Copied from Mappin, et al (2004: np)

Here the instructional designer is able to assume the development of different parts of the course according to the nature of the course. This classroom-oriented design model takes cognizance of instructional objectives and the assessment method to be adopted. Mappin, Phan, Kelly, and Bratt (2004: 01) describe this model as having nine small subsets which symbolize the nine fundamental steps in the instructional design process referred to as the 'comprehensive instructional design plan'. They argue that the identification of instructional problems and specification of goals forms the crucial and basic element of instructional design program. During the planning phase, each and every learner's unique needs should be scrutinized and catered for in the instructional design. Mappin et al (ibid) advocate for the identification of relevant subject matter and tasks aiming at fulfilling the learning objectives which is in line with SAQA regulation. It is important to have the learning objectives clearly marked for the learner's attention. The learning content should be categorized in clusters that will allow for reasonable learning and understanding. Learning should be tactically designed in such a way that it allows for learner creativity, relates to the authentic environment of the learner and enables the learner to relate or associate the learning objectives to real world experiences.

Instructional Development Institute [IDI] Model

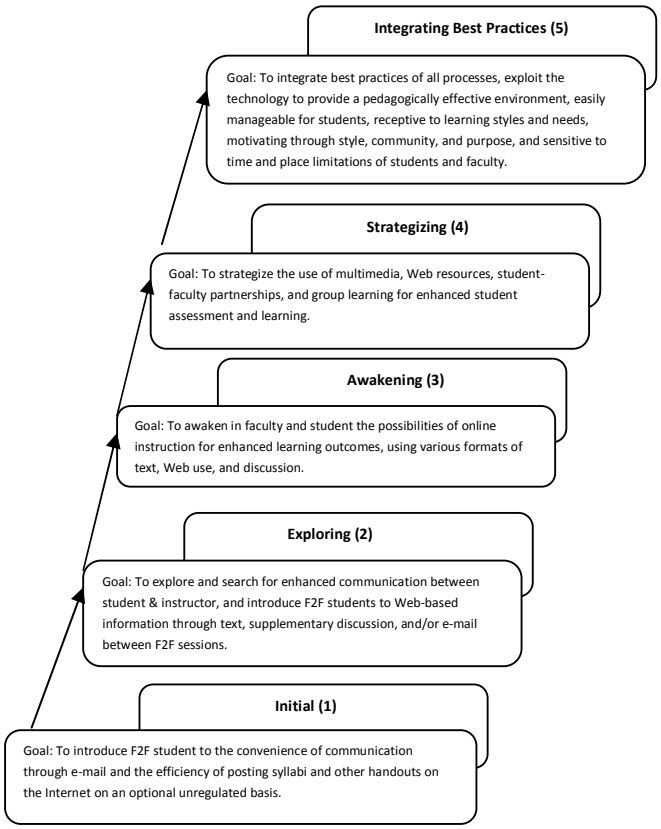
This ID model (Gustafson & Branch, 1997) promotes the identification of needs; which could enable the instructional designer to understand the target audience's learning needs before the design of the learning portal. The design of the learning portal should be clear enough to assist the learner to focus more on the learning content. The role of the subject matter experts in the development of learning materials that address the learning goals is a very crucial part of this model. Gustafson and Branch (ibid) sum up their instructional design by stressing the importance of evaluation, which plays a role of ensuring that the learning portal is well developed with no technical, grammatical and application faults. Course evaluation also involves getting other instructional designers, a group of users to peer review the learning portal before it is launched.

Online Course Design Maturity Model [OCDMM]

According to Neuhauser (2004) this model was developed from the Capability Maturity Model (CMM) for software (Paulk, Curtis, Chrisses and Webber, 2003). The OCDMM is progressive in nature, helping the online course developers' select appropriate actions when designing online courses. OCDMM allows the course developers to integrate their available resources with their knowledge to develop courses that adhere to the principles of best practices in online courses design (Neuhauser, 2004: 03). This model incorporates courses that blend face-to-face and online delivery and the ones that operate online fully. Neuhauser (2004: 3) lays the basic principles of OCDMM as:

1. A mature course design based on best practices, partnered with principles of good instruction is likely to be positively correlated to student outcomes.
2. A mature course design shifts the focus from passive to active learning on the part of the student.
3. Student performance can be continuously measured and improved at multiple levels through multiple means.
4. Improving student outcomes by individualization of instruction is possible through principles of online best practices and good instruction and technology.
5. The improvement of student outcomes can be pursued through an integrated set of proven best practices and processes.
6. The instructor is responsible for providing as many best practices as currently known and feasible, while the students are responsible for taking advantage of them.
7. Since technologies evolve rapidly and best practices change as technologies evolve, the highest level of maturity will continue to ascend in quality and ultimately potential student performance.
8. Institutional standards and incentives can facilitate achieving new levels of maturity in online course design.

Figure 4: Key process area goals by maturity level



Redrawn from Neuhauser (2004: 07)

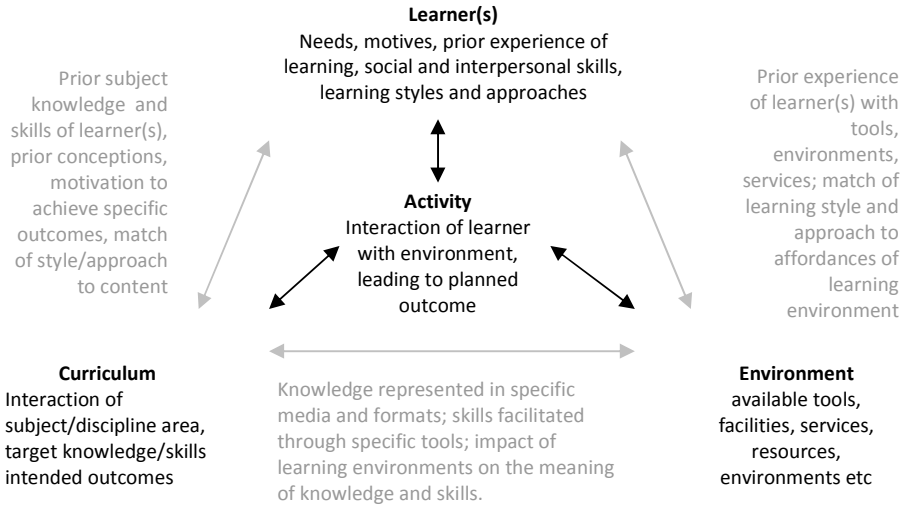
Learning Activity Design (LAD) model

An alternative model to guide the development of the constructivist e-learning environments in South African could be the Learning Activity Design (LAD) model where the emphasis is on designing activities to enhance learning. According to Beetham and Knight (2004) a learning activity is defined as an "interaction between a learner and an environment, leading to a planned outcome…..which makes learning a purposeful activity". Conole and Fill (2005: 08) agree with this, saying that "the essence of a learning activity is that it must have one or more 'learning outcomes' associated with it…to achieve the intended learning outcomes there is a 'sequence of tasks' which must be completed". In developing the Learning Activity Design (LAD) model Beetham and Knight (2004: np) divide the model into 4 contributors to the learning process and highlights the important characteristics they should each compose of to achieve the process of learning as described below.

1. The learners: their needs, motives for learning, prior experiences of learning, social and interpersonal skills, preferred learning styles and expectations of the course and of the practitioner.
2. The learning environment: it can either be face-to-face or virtual, available resources, tools, facilities and services and their match with the learners' needs determines the success of knowledge acquisition.
3. Intended learning outcomes: the purpose behind the learning activity; internal or external goals and targets.
4. The learning activity: this is the centre of the process which represents the means by which the practitioner brings about learning and seeks to influence the development of learners.

As depicted in Figure 5, this model places activities in the centre of the design with Learners highlighted at the top.

Figure 5: Learning Activity Design (LAD) Model



Redrawn from Beetham (2004: 05)

The conceptual models all stress the importance of iteration in the development process and show how each of the elements impact on the other. This is a useful theoretical stance, however, in creating a design model for the South African corporate e-learning sector it may need to be more detailed and procedural.

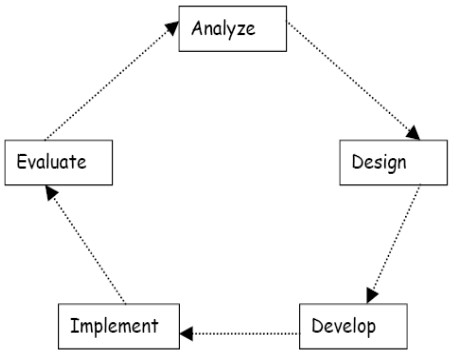
3.8.2 Procedural instructional design models

According to Richey (1990: 124) procedural models 'provide specific guidelines on how to carry out the design project'. They give detailed accounts of how to execute given tasks. Richey (ibid) argues that procedural models are 'product-orientated'. Some examples of the more commonly used procedural models are described below

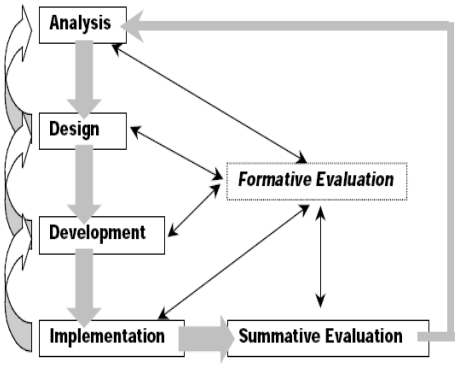
Analyse Design Develop Implement Evaluate [ADDIE]

The ADDIE instructional design model was developed within a learner-centered approach to facilitate interactive and effective learning (McGriff, 2000). Learner-centered approaches stress the importance of the learner in the learning process. This requires the course designers to first examine the learners' needs, course goals, available learning materials and required completion dates if any.

Figure 6: Two different representations of the ADDIE Instructional Design model



ADDIE (adapted from College Station 2001: 05)

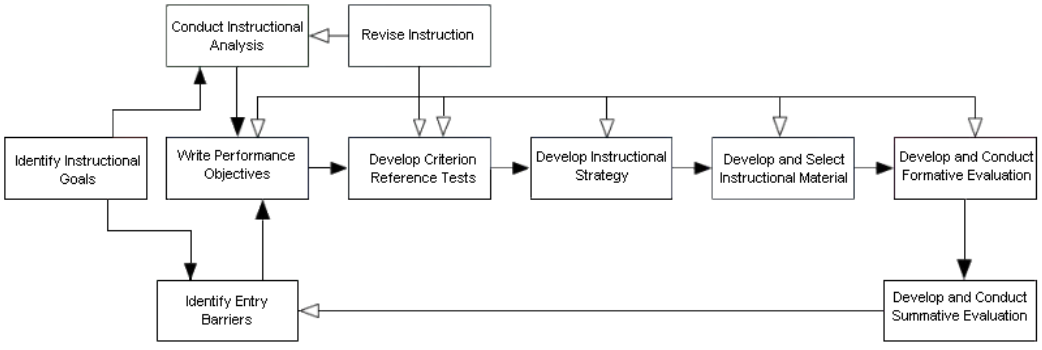


ADDIE (adapted from McGriff 2000:01)

Dick and Carey Instructional Design model

According to Clark (2004) the approach forms the foundation of the Dick and Carey design model whereby lessons are broken into small bits in order to allow the learners to grasp the desired skills appropriately. It is suitable for outcomes based mode of learning or module mastery. This systems-oriented design model guides the instructional designer in identifying instructional goals, conducting instructional analysis, identifying entry behaviours and characteristics, writing performance objectives, developing criterion-referenced test items, developing instructional strategy, developing and/or selecting instructional materials, designing and conducting formative evaluation, revising instruction (based on the results of formative evaluation) and designing and conducting summative evaluation. Gustafson and Branch (2002: 62) posit that this model "reflects the fundamental design process used in many business, industry, government, and military training settings, as well as the influence of performance technology and the application of computers to instruction".

Figure 7: Dick and Carey design model

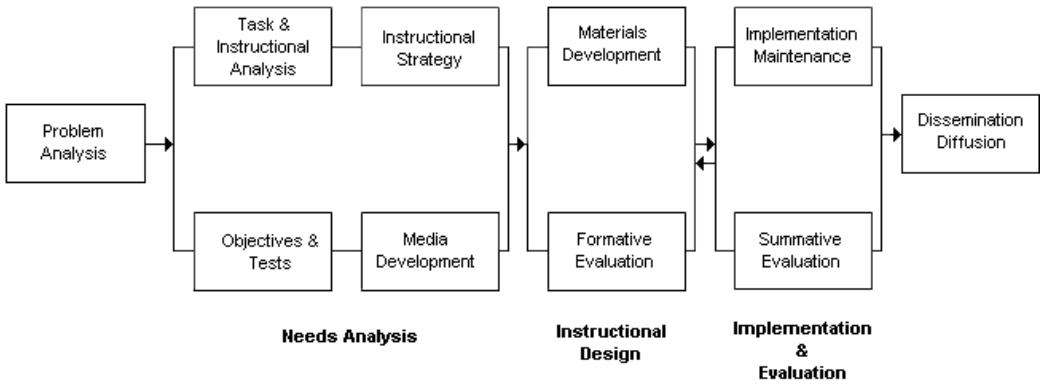


Redrawn and adapted from Clark (2004: np)

Seels and Glasgow instructional design model

According to The Herridge Group (2004: 11) this instructional design model is made up of the needs analysis phase, the instructional design phase and the implementation and evaluation phase. The needs analysis normally assists the instructional designer to plan the project by ascertaining the instructional objectives, the necessary requirements, resources and instructional framework. The instructional design phase requires the instructional designer to do a "task analysis, instructional analysis, objectives and tests, formative evaluation, (learning) materials development, instructional strategy and delivery system" (ibid). These instructional steps necessitate vigorous interaction and feedback with the client. The implementation and evaluation stage is where the "development and production of (learning) materials, delivery of training and summative evaluation" (ibid) takes place. This product-oriented design model is worked on by a team of instructional designers with an aim of producing instructional packages (ibid).

Figure 8: Seels and Glasgow design model



Redrawn from The Herridge Group (2004: 9)

All these procedural models have similar activities and design steps with iterative checks. They differ from the conceptual models by being more prescriptive about each activity. In terms of developing a model for use in an industry that does not necessarily employ qualified educationalist, relying more on subject matter experts, (van Tilburg, 2007) it may be wise to begin with a conceptual framework and tease it out into an adaptable but informed procedural model.

3.8.3 The role of instructional design in ensuring best practice

The question arises, "can one have a best practice compliant learning environment without using a decent instructional design model?" Trivedi (undated: 1) states that a good online course should make use of an instructional design model to ensure 'clarity and consistency'. Many instructional designers (Cyrs, 1997; McGreal, 1997;

Meyer-Peyton, 2000; Tracey and Richey, 2006; Trivedi, undated) have made ID models intended to guide the process of course design and the most common features are clear course structure; proper navigation; relevant course materials; clear tasks, due dates and assessment procedures and evaluation tools aimed at improving the course. Ling, Kong and Lee (2001: 01) in their study on the use of instructional design models for designing web-based courses also argue that the first phase in the SWLing instructional model called the 'Situate phase' helps the instructional designer to know the learning goals and determine the applicable learning materials to be used. The different stages in instructional design models assist the instructional designer to have a detailed understanding of the formative, implementation and the summative phase of the online course. Ling et al (2001) state that best practices in the design of online learning can only be achieved through the use of a decent and well-thought out instructional design model. Siemens (2002: 02) confirms this, he argues that during World War II, the ID approach worked so well in designing corporate training, that it became the basic strategy for designing courses in military spheres, corporate training, textbook authoring and computer-based learning materials.

However, in stressing the importance of instructional design models in the development of online learning Reigeluth (1996, 1997) highlights the significance of the impact of the Information Age. Reigeluth stresses that in this information age, learning should move from being 'standardised to being customised' (1997:45). In the South African context the instructional designer for online learning within the corporate sector needs to be aware of all the legislations, accreditation requirements ensuring conformity with the SAQA and SETA requirements. The designer should also allow for flexibility in different settings where current skills levels, prior knowledge, cultural issues and language differences may influence the instructional strategies

3.9 South African requirements for the design of corporate e-learning environments

As seen in the introduction to the literature review, South Africa has particular legislative requirements that have to be met by corporate e-learning providers. To consolidate the best practices discussed above and ensure legislative compliance the specific needs of SA corporate sector may differ from international needs.

The South African educational system has undergone changes in an effort to standardise education and do away with the segregative system implemented by the apartheid system and the 'fly by night' training institutions. The government of South Africa launched twenty-five Sector Education and Training Authorities (SETAs) in terms of the Skills Development Act. These SETAs were created to harmonize the training in specific economic sectors. Their main duty is to develop skills plans,

implement sector skills plans, develop learnerships, support the implementation of the National Qualifications Framework (NQF), undertake quality assurance of training providers and employers, distribute levies collected from employers in their sector and report to the Minister of Labour and the South African Qualifications Authority (SAQA). Wager (1993: 10) states that there are four main things that have an impact on the instructional design in academic learning, all of which are applicable to the current South African context

1. reformation of national public education
2. pressure to have the instructional design and course development process quicker and cheaper.
3. a switch to performance systems design, and
4. rapid changes in technologies.

The challenge in designing an ID model for South Africa is not simply to make it include South African learning needs but to make it easily usable, adaptable and practical for a variety of settings and learning requirements as well as accommodate a diverse user group.

3.10 Human Computer Interaction in Learning design

According to Nielsen (2000) human computer interface lobbies for use of fewer words when designing learning; “human short-term memory holds only so many chunks of information. If you require users to remember too much, the design will be error-prone and hard to use because people will forget things when you overload their memory” (pg 10). Nielsen (2000) cited in Jasinski (1998) gives five guidelines for structural design of online learning material, stating that

- people read 25% less on screen than on paper, so for a positive experience, there should be only 50% of the amount of text usually presented on paper
- text should be chunked into small, self-contained units that can be linked together with related topics
- the chunk and link system should allow users to explore the material at different depths they can choose for themselves
- the amount of scrolling should be minimised as the majority of users do not scroll down the screen
- the text should be written in a ‘reverse pyramid’ as used by journalists. The main argument is presented at the top of the page and the rest of the article serves to explain it further.

Furthermore, Innoelearning (2003) state that when designing e-learning, help facilities should be availed to the e-learners. They argue that since the use of digital media for learning is new, e-learners might encounter complications which will necessitate the availability of readily accessible help facilities or troubleshooting. They also argue that a good e-learning portal should have a simple user interface.

Nielsen (2003) mentions that for usability to be achieved the following have to be adhered to

Learnability: The user interface one creates should be easy to learn, for the user not to take long to learn you must ensure that you use some of the elements that the user already knows. For example, the computer keyboard adopted the QWERTY keyboard arrangements with some few additions.

Efficiency: Once the interface has been learnt it has to help the user achieve their goals in the desired way in the quickest way possible. This means that the user should be able to format or design the product they want in their own way without having to always follow the designers' style of layout.

Memorability: When designing the interface it must be easy to learn such that the user can remember how it is used even after sometime without using it.

Fast rectification of error-help files: In case the users make mistakes they should be able to use means provided within the interface to recover from such errors. This problem-solving should not take very long since the users want to get their work done without having to go through many complicated steps.

Satisfaction: the user should be able to use the interface with satisfaction and ease. The user should be able to achieve what they want to their satisfaction without having to look for other interfaces to provide it for them.

3.11 Conclusion

This section reflects an overview of published research and recognised best practices. It highlights universal issues as well as issues pertinent to the South African corporate sector. In terms of development research this informs the interrogation of practical problems and will be used in the development of a solution. Chapter 4 looks at current practices in the local South African setting.

Chapter Four: Investigation of Current South African Practices

4.1 Introduction

This chapter presents the results from the research into current practices in South Africa the data analysis and the discussion thereof. There are three main sections to this chapter; (1) analysis of three online learning courses by educational experts, (2) comments from practicing instructional/learning designers on the processes they follow and (3) responses from interviews with subject matter experts. It was not possible to get information from learners who were the fourth intended source of data for this chapter as practitioners were reluctant to provide participant information. This is of major concern as the views of the learners are paramount to such an evaluation. No reasons were given by the companies but it fits with Jaffe's (1989) assertion that corporations have significant financial motivation to keep a "closed shop".

The results are obtained from questionnaires and interviews with participants. The data was managed according to the procedure prescribed by Schurink (2003) where the data was first transcribed, recorded and filed in different folders. The data was then uploaded to QSR NVivo 7 categorised according to themes and topics; the patterns of understanding were then assessed then lastly the prevailing themes were linked to the best e-learning practices in the corporate sector in South Africa. According to Henning (2004:105), once the transcription is ready and codes have been awarded to different segments or units of meaning, the related codes can be grouped or categorized.

4.2 Analysis of existing online learning courses

Taking into consideration the idea that many online courses are developed without using an instructional design model, the process of data collection commenced with a study of existing online courses developed for and used by industry.

Using best practices identified in the literature review as a guide, the aim of this particular evaluation was to solicit feedback from the e-learning educational expert about current e-learning portals. This was done by obtaining answers to the following questions:

1. Whether the educational experts thought the e-learners would be able to know how the e-course/s was going to enhance their skills?
2. If the instructional design of the e-learning course/s was based on sound principles of educating and learning?
3. If the e-course/s was learner centred and allowing the learners to freely choose how they wanted to construct their knowledge?

4. If the content in the site logical does it address a specific theme and conform to the SAQA and SETA requirements?
5. If the pace of the learning system is appropriate for the tasks and does it facilitate lifelong learning?
6. Does this learning system allow for appropriate interaction amongst the learners?
7. Does the learning system provide metacognitive support?
8. Does the screen design of the learning system follow the instructional design principles?
9. Is the colour appropriate for the online learning system?
10. Does the colour accommodate the colour-blind users?
11. Are the screen displays cluttered?
12. Is this e-learning portal easy to navigate?
13. Does the e-learning portal operate faultlessly? Does the log-ins work? Is the download time adequate? Is it compatible with all browsers and is the server always available?

This was conducted through the use of a questionnaire (Appendix C) answered by practising educational experts. A pilot study of the research instruments was conducted by four peers. One of them raised a concern about Likert scale used for rating purposes. A person could select option 3 for reasons other than the one stated in the question. The issue was discussed but the majority of assessors felt that if the research respondents wanted to use 3 for any other reason other than the stated one, they would use the comment space to clearly express their views. An instruction was given on the five point Likert scale ranging from 1=strongly disagree, 2=Disagree, 3=neither agree/nor disagree, 4=Agree, 5=strongly agree, to determine the best practices in the design of e-learning, the educational experts, instructional design experts and the subject matter experts. The data was collected through e-mail, telephonic interviews and face-to-face interviews where it was possible.

4.2.1 Participating Educational experts in this study

A total of six people who were considered “educational experts” were approached to review the courses. To highlight the criteria that qualified these people as “experts” their experience and qualifications are outlined in Table 3. It should also be noted that each course was reviewed by only four of the six experts, identified by respective RP numbers.

Table 3: Educational experts included in the sample

Research participant	Qualification	Specialisation within ICT	Years of experience in e-learning	Course(s) Reviewed
RP1	MA and currently working towards a PhD in ICT and e-learning.	Instructional designer	+5 years	1, 2
RP2	MA (Digital Media)	Educationalist by profession and owns an ICT company	+5 years	1, 2, 3
RP3	MEd (Educational Technology), and currently working towards a PhD in Educational Technology	Educational Technology and senior lecturer	+8 years	2
RP4	MA (Digital Media)	Instructional designer and senior lecturer in Information Systems	+ 5 years	1, 2, 3
RP5	PhD in Biology and renowned Online Learning Researcher	Online learning designer and educational theory	+10 years	1, 3
RP6	MSc (Computer Science)	Use of technology in Education and Human Computer Interaction	+8 years	3

4.2.2 Reviewer responses

The selection of “cases” was entirely pragmatic as they were known to the researcher. In addition, the company that did the development, works for a number of different industrial sectors and the cross section of courses was viewed as being representative of the types of courses developed for industry. For this research the data was collected from three courses from three different companies. The objectives of the courses are described below.

Course 1 is intended to ensure various rigorous development initiatives for all employees at all levels. The courses offered focus on preparing the employees to provide customer services which includes knowing how to take a bulk order, completing of invoices and other documents.

Course 2 was considered an emergency training intervention intended to train the employees to get accreditation from their SETA. The company wanted to adhere to government criteria and claim the training levies. The course is aimed at enabling the employees to perform their duties in a productive manner and make them critical

thinkers and lifelong learners who can deal with any situation they face. This company focuses on the international insurance and financial services sector.

Course 3 provides training in the field of real estate services focusing on residential, commercial, relocation, referral and asset management. The global nature, and the high demand, for the goods and services offered by these particular companies necessitates that all their employees undergo ongoing training. It is, however, critical that the employees are able to continue with their normal working hours. The delivery of "any time" online training was thus seen as desirable.

Four of the six educational experts reviewed each of the courses. Data was analysed in terms of pedagogical principles, educational theory and practice as well as cosmetic design and program functionality.

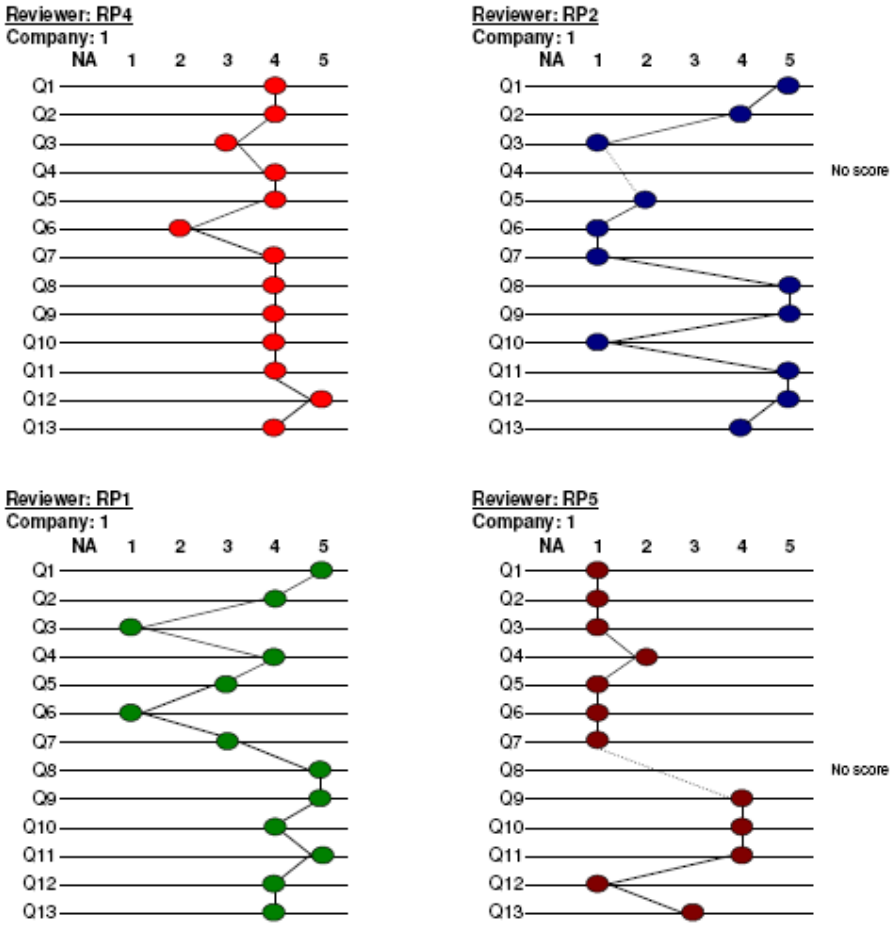
Each of the courses is dealt with in detail outlining the educational expert's perception in relation to the literature reviewed.

Course 1

Customer service is a key element of this business. The educational expert reviews were answered by four educational experts. To make the analysis and data interpretation easier, data were collected according to the three main areas; pedagogical principles, educational theory/practice, cosmetic design and program functionality.

Figure 9 below charts the responses of each reviewer per question. There are clearly quite divergent views of this course. RP5 was relatively scathing in his assessment of this site with no score reading above a middle point for the educational questions (Q1 – Q7). RP2 was more generous, his scoring a high 5 for "properly designed" and 4 for "pedagogical principles" (Q2), however he acknowledges there are no constructivist principles in use (as per "audience and business requirements"). He claims that SETA conformity was not a requirement and scores a moderate 2 for the facilitation of lifelong learning as "this course was not intended to facilitate lifelong learning, but was an emergency training intervention". Unfortunately RP4 did not give any comments (and a follow up interview was required to more fully understand her point of view) but scored the course well except for Q3 – constructivist principles – where she neither agreed nor disagreed with the statement. This is perplexing as this respondent is an educator well versed in the different educational theories.

Figure 9: Educational Expert responses to a review of course 1



If one looks at the table below, however, it is easier to see where there is some commonality. Most respondents agreed on Q2, Q3, Q6, Q10 and Q13.

Table 4: Summary of Educational Expert responses for course 1

	NA	1	2	3	4	5	No Response	Total
Q1		1			1	2		4
Q2		1			3			4
Q3		3		1				4
Q4			1		2		1	4
Q5		1	1	1	1			4
Q6		3	1					4
Q7		2		1	1			4
Q8					1	2	1	4
Q9					2	2		4
Q10		1			3			4
Q11					2	2		4
Q12		1			1	2		4
Q13				1	3			4

(n=4)

Question 1
According to Innoelearning (2003: 14) the learning or course objectives and the benefits of the course should be clearly indicated to the learners. Innoelearning argue that these course objectives should be given to the learners on the course orientation day such that they lay out their own personal strategies of how they want to achieve the desired objectives. While the educational experts were asked to evaluate the e-learning courses using the Likert scale, for the purpose of better understanding they were also given an area where they could enter additional comments.

In this question, two out of 4 educational experts "strongly agreed" and one educational expert "agreed" that Company 1's online learning course was designed to facilitate learning and have clearly outlined course objectives.

However, one educational expert who also designs e-learning for one e-learning design company in Australia felt that the course objectives were not clearly stated and the course was not facilitating learning. Another of the educational experts stated:

RP2: *"While the objectives are clearly stated, I do not think that they are fulfilled in this section of the course (New Invoice System ver 1.0)"*

Question 2
Here the respondents felt this was adequately addressed with 3 respondents giving a score of 4 out of 5. This question seeks to find out if the e-learning course was designed with a sound pedagogical philosophy in mind. Pedagogy forms the most crucial part of learning design. The Center for Dental Informatics (1999) prescribes six pedagogical issues to be addressed by learning designers, that is "appropriateness of the computer, appropriateness of the methodology, student practice, lesson length, mastery level and ability to adapt to learner' skills and knowledge".

RP1: *"All the courses contain clear descriptions of the material to be covered. It is covered in small manageable chunks and learners are given the opportunity to assess themselves… This would improve the learning experience. It is good to see that there is more feedback in some of the questions, than a simple, 'correct/incorrect'".*

RP5: *"Too much content focused not enough interaction".*

During an in-depth interview one educational expert who is also an instructional designer expressed the view that learning design should be based on the andragogic learning approach.

RP2: *"… I think that androgogic approach should be used in all learning, if by this we mean: authentic learning, using social forms of learning, using self directed learning methods and goal directed".*

Edwards, Raggat and Small (1996) view andragogy as being based on four assumptions about the behaviour of adult learners; that adults change from being dependent to being self-directing; they develop a body of experience which they draw on for their learning; that adults' learning becomes linked to their social roles and finally their need to know becomes linked to the immediacy of problem solving. Knowles (1980) asserts that andragogy is the science of educating or training adults.

Question 3
Here three educational experts were of the view that this was not applied. The constructivist approach gives the learner a chance to be in full control of their own learning, including the selection of material and to a large extent the manner of engagement. The course facilitator provides the core learning material, an engaging environment and real life tasks that support interaction with their peers and engagement with a variety of materials.

RP2: *"These courses are very much self-paced courses. Learners work their way through the learning material and then take part in a summative quiz at the end".*

RP4: *"However, there could be more peer reviewing (reflection)".*

However, 1 educational expert "neither agreed nor disagreed" that Company 1 e-learning course was designed using the social constructivist approach.

RP5: *"There is no opportunity for learners to engage in social constructivist learning activities"*.

RP5: *"Very behaviouristically designed".*

RP6: *"Although attempts have been made to include a constructivist environment by the inclusion of discussion forums, constructivism is more than that. In my view the use of 'authentic tasks' would add considerably to the value of the learning experience".*

On the same note, the same educational expert expressed his thought that the online courses were designed according to the behavioural approach to learning. The use of the behavioural approach which is teacher-centred is regarded as inappropriate for e-learning because it does not allow for interactive learner-centred learning, Clearly taking the responses for Q2 and Q3 together, not all reviewers felt that sound pedagogical philosophy is necessarily constructivist pedagogy.

Question 4
In 2000 the government, through the Department of Labour, regulated that the Sector Education Training Authorities (SETA) would have to apply to South African Qualification Authority (SAQA) for permission to execute the Education and Training Quality Assurance (ETQA) quality assurance duties within the specific sectors, as discussed at the beginning of Chapter Three.

Two educational experts "agreed" that this e-learning course was designed logically and followed detailed stages. However, for this specific course legislative requirements were not met.

RP2: "*… it was not necessary to have SETA conformity*".

One respondent claimed not to know much about the legislative requirements:

RP1: "*I do not know much about SAQA and SETA requirements, but the material is logical and clearly defined*".

Question 5
Lifelong learning is an important element in the learning process as Jasinski (1998) mentioned that it is one of the elements that 'ensure that the market demand in the knowledge economy is assured'. As can be seen in the chart above one educational expert "agreed" that the corporate e-learning courses facilitated lifelong learning amongst the employees. According to Gustavsson (1997) lifelong learning is based on two main traditions which is the human resource development for the economy and the promotion of democracy and citizenship in the interest of the majority. The World Bank Group (2001) argues that the "lifelong learning framework encompasses learning throughout the life cycle, from birth to grave and in different learning environments, formal, non-formal and informal".

RP2: "*The course was designed to enable learners to be critical of their work environment and to build on the skills covered in the course*".

However, one reviewer disagreed with the statement that the e-course facilitated lifelong learning. One of the reviewers even asked the researcher on the questionnaire where the e-learning design facilitated lifelong learning in the e-course as illustrated below.

RP5: "*How does it do this?*"

And one educational expert who also happened to have been the instructional designer for one e-course declared that this particular e-course "*had not been*

intended to facilitate lifelong learning, but was meant to provide emergency training intervention".

Question 6

Here three of the educational experts 'disagreed' and one 'strongly disagreed' that there was an element of interaction in the corporate e-courses they evaluated. Interaction is an important element in the learning process because it allows the learners to share information. The responses from all the educational experts proved that this particular learning portal had no interactive element in it:

RP5: (interaction) "*None visible*", "*Limited*"

RP2: "*There does not seem to be any opportunity for collaboration at all*"

RP6: "*I notice that not one of the participants has made use of the discussion forum. When I went into that option I noticed it was being used as a help facility, I would not think to use it to engage fellow participants. No questions have been phrased or directions given to encourage the sharing of knowledge and experience (no interaction)".*

Question 7

Metacognition is believed to be an important element of teaching and improving learning performance (McCrindle & Christensen, 1995; Nelson, 1996; Nashon, Anderson & Nielsen, 2005). According to Winn and Snyder (1998) metacognition is facilitated by 'monitoring of progress' and 'making (appropriate) changes and adapting' new strategies when necessary. Gordon (1996) in stressing the importance of providing metacognitive support in every online courses, asserts that learning design should always aim at building learner-centered e-learning courses that expand on the learners' metacognitive 'abilities and problem solving skills'. None of the respondents 'strongly agreed' that the courses provided metacognitive support, one "agreed', one 'neither agreed/nor disagreed' with comments like:

RP5: "*Not clear*"

Two educational experts "strongly disagreed" that the corporate e-learning courses provided metacognitive support for the e-learners.

RP1: "*There is minimal metacognitive support*"

Question 8

Two educational experts felt that the e-course fully conformed to the instructional design principles, one thought conformity was slightly visible and one reviewer did not express his/her views on this matter.

Question 9
AppleMacintosh (undated) stresses the importance of colour in online design by saying that “colour should be used redundantly, it shouldn’t be the only thing that distinguishes two objects; there should be other cues, such as text labels, shape, location, pattern or sound”. According to Shneiderman (1987) an expert in HCI argues for the use of color and other ‘screen design techniques to give an aesthetic appearance’, they also argue against overuse of ‘a single technique and complex screen designs’ which they state will sidetrack the learners in their learning process.

RP6: “*The colour at first view appears a bit bland but it includes the logo*”

Though none of the educational experts indicated ‘strongly disagree’ for proper use of colour in the corporate e-learning portals, one of them raised a concern in the comment box about a portal that had a:

RP2: “*The layout of the site is sterile and could do with some cosmetic improvements*”

Question 10 - Colour-blind users

Does the colour accommodate the colour-blind users?
This question aimed at finding out if the colour of the e-learning portals accommodated colour-blind learners. Tognazini (undated) stresses the importance of ensuring that colour is used in a friendly and considerate manner by promoting the use of ‘secondary cues to convey the information to those who won’t be experiencing any color coding’. In this case, 3 educational experts ‘agreed’ that the corporate e-learning portals accommodated the colour-blind learners. Though the researcher is of the view that some of them did not have an acceptable understanding of what colour-blindness is.

RP1: “*… on the whole the colour scheme is clean and easy to read with high contrast between background colour and text*”

In the same instance, one educational expert who is also a Human Computer Interaction specialist suggested that “*suitable tests should be made with people with colour discrimination deficiencies (colour blindness)*”. Another claimed to ‘neither agreed/nor disagreed’ which echoes the researcher’s sentiment that some of the respondents did not have a proper understanding of colour-blindness and how it impacts on affected people trying to use computer systems. Fowler and Stanwick (1995), cited in Murrell (1998), states that “6.39% of the population is unable to distinguish between red, green and yellow, 2.04% cannot distinguish between shades of red, 0.0003% have difficulty with shades of blue and 0.0005% suffer from total colour blindness seeing only in shades of gray”.

RP1: "*I think some colours might be difficult for some readers*"

Question 11 - Screen displays

This question seeks to find out if the corporate e-learning portals were cluttered in their appearance. According to Shneiderman (1987) fonts, fonts sizes, colours and layout has to be chosen with caution so as to avoid a cluttered look of the e-learning portal. According to him too much content on the screen distracts the learner from the fundamental information. He also warns instructional designers against overusing frames, saying that they lead to a cluttered appearance. The general view from the educational experts (two 'strongly agreed' and two 'agreed') was that the e-learning portal had a cluttered appearance.

RP1: "*…the icons in the left-hand side tree menu distort the whole menu system, which does clutter that section of the screen*".

RP1: "*The only issue is that some of the "click here" links at the end of the screencasts are not easily identifiable as links. Furthermore the icons in the left-hand side tree menu distort the whole menu system, which does clutter that section of the screen*".

Question 12 - Navigation

This section addresses the issues of navigation within the corporate e-learning portals. Navigation forms a crucial element in online design. Murrell (1998: np) states that in her research study most "users complained that they felt lost in the cyberspace particularly when they dealt with hypertext type documents, they are unsure of where they had been, where they still need to go and if they have read all the material available". In this case, two educational experts indicated that they 'strongly agreed' that the corporate e-learning portals they reviewed had proper navigation. One 'agreed'.

RP6: "*I notice that icons are suitable labeled with alt text which should help with navigation*"

RP2: "*Care has been taken to ensure navigation and flow is taken into account*".

However, one educational expert expressed the view that the navigation was not clear.

RP2: "*Got lost a few time. Instruction too far away from interaction*".

RP2: "*Navigation too hierarchical: can't go forward or backwards*"

Question 13 - System operation functionality

Does the e-learning portal operate faultlessly? Do the logins work? Is the download time adequate? Is it compatible with all browsers and is the server always available?

This question seeks to find out about the general operation of the e-learning portals. Three educational experts 'agreed' that the learning portal functioned generally well, however one educational experts expressed that he/she 'neither agreed/nor disagreed'.

RP5: "*Menus are both on the left and right – confusing.…Why do I have to login more than once?*"

RP2: "*The site is appropriate for its intended purpose of covering essential training in a convenient and assessed manner*".

The final area of commonality was the program functionality and the respondents gave a general score that showed that no technical faults were likely to place undue pressure on users.

Course 2

The educational experts scored in a manner that shows that general view that Company 2's online learning portal is designed with best practices in mind. When one looks at the table summarizing that educational expert responses below, it is clear that the three educational experts tended to give a score that is above average. This generally means that the e-learning courses are designed to facilitate life-long learning and critical thinking through learner-centred approaches.

Figure 10: Educational Expert responses to a review of course 2

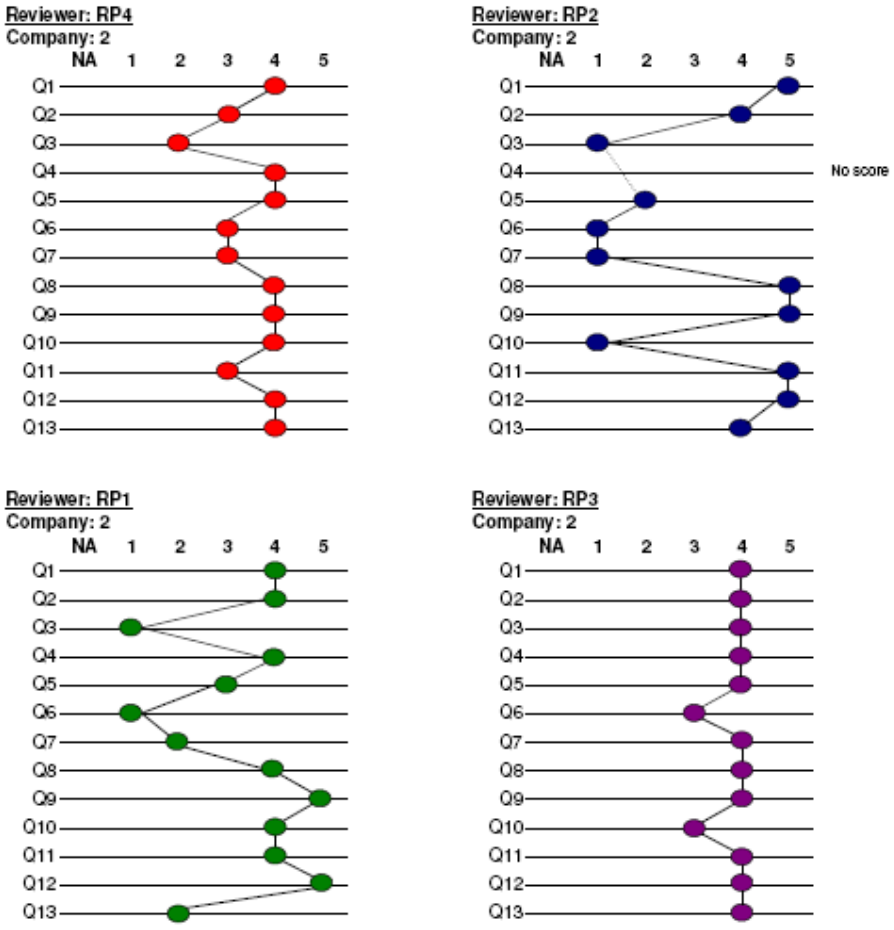


Table 5: Summary of Educational Expert responses for course 2

	NA	1	2	3	4	5	No Score	Total
Q1					3	1		4
Q2				1	3			4
Q3		2	1		1			4
Q4					3		1	4
Q5			1	1	2			4
Q6		2		2				4
Q7		1	1	1	1			4
Q8					3	1		4
Q9					2	2		4
Q10		1		1	2			4
Q11				1	2	1		4
Q12					2	2		4
Q13			1		3			4

(N=4)

Question 1
In this question, three out of 4 educational experts “agreed” and one educational expert “strongly agreed” that Company 2’s e-learning course was designed to facilitate learning and has clearly outlined course objectives.

RP1: “…*the objectives are clearly stated…*”

The other educational experts indicated “agree” and did not make any supporting comments.

Question 2
Three educational experts indicated that they “agree” that the e-learning course’s instructional design was based on sound pedagogical philosophy.

RP1: *“…contains clear descriptions of the material to be covered. It is covered in small manageable chunks and learners are given the opportunity to assess themselves…*”

One educational expert indicated “neither agree/nor disagree” and refrained from typing in her comments on her indecision. The researcher conducted a follow-up interview where the educational expert indicated that her hesitancy was due to lack of understanding of Company 2’s educational content.

Question 3
Two educational experts “strongly disagreed” and one “disagreed” that the e-learning course was based on the social constructivist pedagogy.

RP1: “*These courses are very much self-paced.…There is no opportunity for learners to engage in social constructivist learning activities*”

RP2: “*An instructivist approach was used for the training based on audience and business requirements*”

One educational expert “agreed” that the e-learning course conformed to the social constructivist pedagogy.

Question 4
Three educational experts “agreed” that the e-learning course was logical, addressed a specific theme and conformed to the SAQA and SETA requirements. However, one educational expert who is also an instructional designer for this particular e-learning course did not score giving a reason that:

RP2: “*But it was not necessary to have SETA conformity*”.

Question 5
Two educational experts "agreed" that the pace of e-learning was appropriate for the tasks given out to the e-learners, one "either agreed/nor disagreed" with no explanation of the cause of uncertainty. One educational expert who designed the e-learning course "disagreed" saying that:

RP2: "*The course was not intended to facilitate lifelong learning, but was an emergency training intervention*".

Question 6
Two educational experts neither agreed nor disagreed that the e-learning course for Company 2 allowed for appropriate interaction amongst the e-learners. The other two educational experts stated that the course was not interactive. The e-learning course for Company 2 was more instructive and facilitator–driven.

RP4: "*There does not seem to be any opportunity for collaboration at all*"

Question 7
This question seeks to establish if the online course provided metacognitive support for the e-learners, the views of the educational experts varied from disagree to agree. One said 'disagree', one 'strongly disagree', one 'neither agreed/nor disagreed' and one 'agreed'. The difference in their scores makes the researcher wonder if their views were informed by their expertise in e-learning design or more about the way in which they evaluated the e-learning course.

RP2: "*There is minimal metacognitive support*"

Question 8
Here three educational experts 'agreed' and one 'strongly agreed' that the e-learning course for Company 2 was designed with the instructional design principles in mind.

RP2: *"Care has been taken to ensure navigation and flow are taken into account*"

Question 9
All the educational experts gave positive scores for the appropriateness of the colour in the e-learning course; two 'agreed' and two 'strongly agreed'. This should, however, be viewed along with question 10 which enquired if the colour of the e-learning course accommodated colour-blind users. One educational expert 'strongly disagreed', one educational expert who also designed this e-learning course 'disagreed' stating that:

RP2: "*This aspect was not taken into account*"
RP1: "*I think some colours might be difficult for some readers...".*

The other two educational experts ‘agreed’ that the colour would accommodate colour-blind e-learners. They however refrained from adding more comments on why they thought so.

Question 11
Two educational experts ‘agreed’ and one ‘strongly agreed’ that the e-learning course displays were not cluttered.

RP4: “T*he site is clear and not overloaded*”
RP1: “*(it is not cluttered) The only issue is that some of the “click here” links at the end of the screencasts are not easily identifiable as links”.*

However, one ‘neither agreed/nor disagreed’ and did not explain why they refrained from commenting.

Question 12
In this aspect, all the educational experts expressed the same positive view that navigation was easy in this e-learning course. Two scored ‘agree’ and two scored ‘strongly agree’.

RP4: “*Navigation is relatively fair*”

Question 13
This question seeks to find out if the Company 2 e-learning course operated faultlessly from aspects of logins, downloading time, and browser compatibility; one educational expert ‘disagreed’ and said that:

RP1: “*One of the links did not work*”.

The other three educational experts ‘agreed’ that the e-learning course worked faultlessly.

RP2: “*The site is appropriate for its intended purpose of covering essential training in a convenient and assessed manner*”.

Course 3
In company 3, the educational experts scored in a manner that shows that they carefully studied the e-learning course. Their varied responses also indicate that they were influenced by their experience in e-course design. When one looks at the table summarizing that educational expert responses below, it is clear that the three educational experts gave above average scores, whereas one educational expert gave different scores with many comments and refrained from responding to Question 12 and 13.

Figure 11: Educational Expert responses to a review of course 3

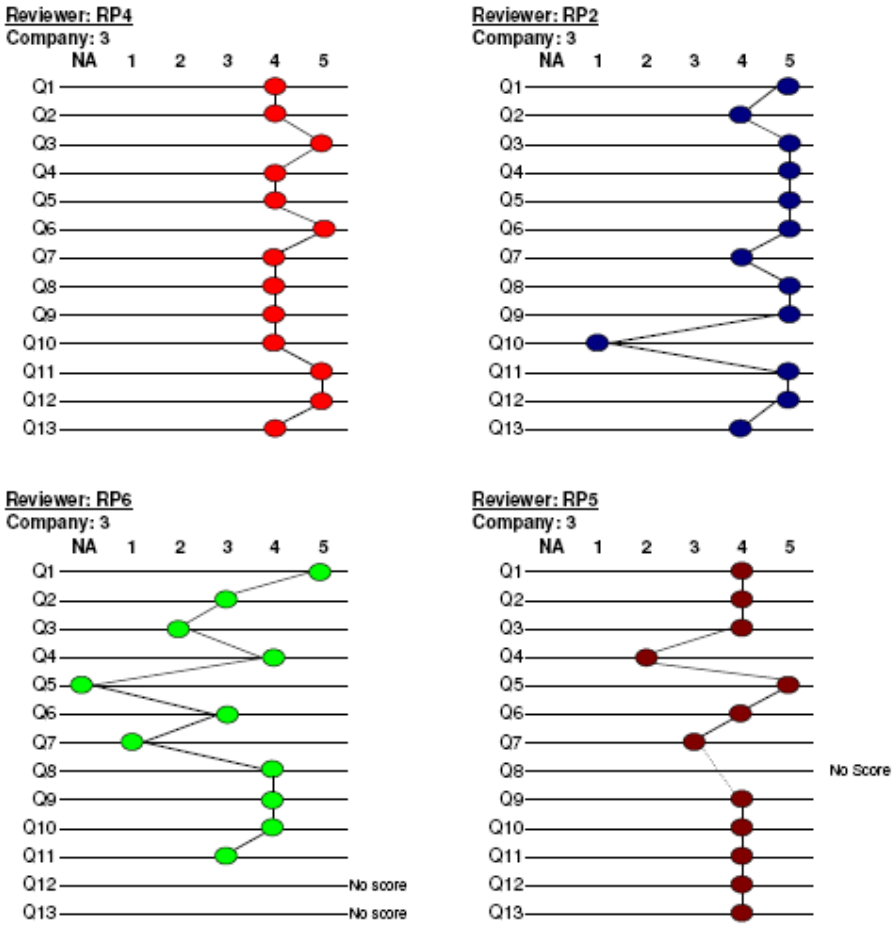


Table 6: Summary of Educational Expert responses for course 3

	NA	1	2	3	4	5	No Score	Total
Q1					2	2		4
Q2				1	3			4
Q3			1		1	2		4
Q4			1		2		1	4
Q5	1				1	2		4
Q6				1	1	2		4
Q7		1		1	2			4
Q8					2	1	1	4
Q9					3	1		4
Q10		1			3			4
Q11				1	1	2		4
Q12					1	2	1	4
Q13					3		1	4

(n=4)

Question 1
Here all the four educational experts scored positively meaning that the e-learning course for Company 3 is properly designed to facilitate learning in the corporate environment. Two educational experts 'agreed' and two 'strongly agreed' with this notion, all of them did not add any comments in the space given which could be an indication that their agreement had no reservations.

Question 2
In this section, three educational experts 'agreed' that the instructional design of Company 3's e-learning course was based on a sound pedagogical philosophy.

RP2: "*…A social constructivist approach was taken as this best suited the student needs*".

Another educational expert, expressed the view that the use of 'authentic tasks would have enhanced the e-learning best for the students.

RP6: "*…In my view the use of "authentic tasks" would add considerably to the value of the learning experience…*"

However, one educational expert 'neither agreed/nor disagreed'.

Question 3
The general consensus here is that the Company 3 e-learning is based on the social constructivist pedagogy. Two educational experts 'strongly agreed', one 'agreed' though one 'disagreed' giving the reason that:

RP6: "*Although attempts have been made to include a constructivist environment by the inclusion of discussion forums, constructivism is more than that*".

Question 4
In this question two educational experts 'agreed' that the e-learning course was logical, addressed a specific theme and conformed to the SAQA and SETA requirements. However, one 'disagreed' and one did not respond; according to both of them their responses were supported by their lack of understanding of the SAQA and SETA requirements. These training and accreditation issues tend to be well understood by the corporate trainers and learners.

4.2.3 Discussion of Educational Expert responses

Comments from the educational experts highlighted issues related to educational theory, cosmetic design, technological functionality, course preparation and design process, learning activities and finally instructional strategies. This are discussed more fully below:

Educational theory – it is clear that there can be valid differences in opinions about both the educational and cosmetic design elements in a course. The most glaring disparity is the difference in perception of the full implementation of a constructivist learning environment and how best to implement this. It is important to note that courses are designed, and will continue to be designed; to meet client specifications but more could be done to ensure constructivist elements of discussion, social learning and peer review, authentic tasks and authentic assessment are built into the courses.

Cosmetic design – The differences of opinion in the cosmetic design are not major. While basic design principles should be accommodated, the instructional design model should create a space for the cosmetic design to be assessed by the users as they are ultimately the people who have to work with the system and navigate to various options. Care should be taken to accommodate various navigational directions.

Technological functionality – on the whole the technology seemed to function adequately indicating that a level of technological maturity has entered the market lessening the likelihood of connectivity failures. However, more needs to be done to ensure accessibility for all users regardless of physical challenges. These needs should be appropriately identified in the Instructional Design needs analysis phase. In the maintenance phase it is important that online learning practitioners ensure hyperlinks are updated and kept active.

Course preparation and design process – Only one of the reviewers was able to comment on this aspect and has noted when the courses were developed without adherence to “best practices” for practical reasons. These anomalies should be catered for within the instructional design needs analysis.

Learning activities – several reviewers commented on the need to establish authentic tasks and good discussion areas in the design of the courses, and this along with authentic evaluation needs to be a key area of development addressed in the Instructional Design model. This is particularly important if one is to move e-learning away from the simple delivery of content to a system that supports life-long adult learning in authentic contexts.

Instructional strategies – were not varied within courses and although it is not always possible to accommodate a variety of strategies, this should be an option to be explored in the instructional design model.

4.3 Instructional Designers' responses

Having investigated some online courses the next step was to gather information from instructional designers in terms of the processes they use to develop learning environments. The seven guiding questions are presented as Appendix D.
The questions were presented to 3 people who consider themselves instructional design practitioners, all three work within the corporate e-learning environment.

Table 7: Instructional design experts included in the sample

Research participant	Qualification	Current work in corporate e-learning as stated by the respondents
ID1	Masters degree and currently working towards a PhD in ICT, digital media and e-learning	Outside consultant performing a variety of roles such as analysis, high-level design, instructional design, development, error-checking and bug fixing and documentation. (ID1 works for a company that does in-house training for local and international branches.)
ID2	Teaching qualifications studying towards a Master of Digital Media Studies	Instructional designer (as an outside developer)
ID3	Diploma in Online Course Design	Project and System Support administrator

4.3.1 Procedures followed

In answering the question related to procedures followed two (ID1 and ID2) of the respondents gave an answer that could, broadly, be interpreted as adhering to the ADDIE instructional design model. ID1's response was the most detailed giving 24 broad steps which include regular reviews. ID2 gave a five point process starting with a client brief, followed by development and review and ending with implementation and "*post release evaluation*" and "*tweaking*". ID3 states that she is only involved "*after our team and client have discussed the brief*" and although she states she works "*with a team of people to produce the end result*" it appears her role is focused on content quality control rather than educational processes as she states "*I am required to check site (on-line) content and support content team to ensure the highest quality is achieved. Uniformity in content style and format, questions are relevant to content*". In addition she is involved with computer support and training for clients.

4.3.2 Legislative needs

In terms of legislative requirements, ID1 was not aware of any legal constraints for the courses he develops, ID2 stated SETA, and ID3 says that her organisation "*adhere[s] to the South African Qualifications Authority (SAQA) as laid out by the applicable SETA*".

In ensuring adherence, ID1 states that there is none, ID2 covers this requirement in discussion with the client and specifies it in the needs analysis phase while ID3, who appears to be far more aware of this need, simply states "*the client will request this and we follow through*".

4.3.3 Cultural needs

Both ID1 and ID2 focused on the multi-lingual aspect of this question. While generally recognising the importance of cultural issues when developing for an international audience ID1 focused on the language issues and stated that "*all courses are developed in English … which I feel impedes the effectiveness of such courses. Translated material might help make more effective learning experiences*". ID2 also saw this issue from a linguistic perspective "*although the lingua franca is English, we do take into account the language skills of the users and adjust the content accordingly*". ID3 had a different perspective stating "*courses are designed with the level of the learner in mind. Applicable tools and language are used. Graphic design concepts are used as a universal tool of communicating course content to the learner*".

While all three seem to see that accessible language is important, none of the respondents mentioned designing courses with culturally relevant authentic tasks, sensitivity to cultural and gender representation. The assumption that culture is equitable to "level" is disconcerting as is the concept that graphics are not only culturally neutral but are a "universal tool" for communication. None of the respondents stated that their courses were reviewed by a diverse group representative of the demographics of the intended audience.

4.3.4 Accessibility for differently-abled learners

ID1 was aware of the needs of the disabled community in terms of learners who have visual or hearing challenges. He states they do attempt to address these needs "*but not to the extent that I would prefer*". According to ID1 care is taken that "*text is readable and would allow resizing*" which caters for the partially sighted, but according to ID1 this is sometimes overridden by "*team members [who] make decisions based on the inherent appeal of the media, rather than its usefulness for those learners with special needs*". "*Some of the material [developed allows] … text to speech reading*" catering for the needs of blind users, and "*colour is looked at*

carefully for colour blind learners, but this is not always carried through". "*Visual material, such as animations, is also always supplemented with textual descriptions*". Catering for deaf learners "*audio is always supplemented by captioned text*" and "*sound is never the only source of information*".

ID2 does not take these into account "*unfortunately we have not added this to our workflow process*", and ID3 left this question blank. None of the respondents mentioned use of alternative access for people who do not have full mobility or that they attempt to conform to the requirements of assistive devices developed for such users.

4.3.5 Educational theory

ID1 appears to be well versed in educational theory applicable to e-learning environments stating that within the "*eclectic-mixed methods-pragmatic paradigm*" he implements "*social constructivist theory, Bloom's Taxonomy, cognitive flexibility theory … situated or anchored learning*". However he feels constrained by the client requirements as "*most clients do not want collaborative courses, making it difficult to implement social constructivist theory*". ID2 states "*we are familiar [with the latest educational theory related to online learning] and incorporate all designs but with a preference for social constructivist methodology*", however he gives three examples two of which are specified as instructivist and the other social constructivist. ID3 states they incorporate "*scaffolded learning, social constructivism and collaborative learning*".

It is clear from the two responses to this question (ID3 claimed this was not within her ambit) that client's requests often override advice from the Instructional Designer.

ID1: "*My advice is not always heeded. For example, some clients use expensive content management or learning management systems (LMS) which do not offer any tools for collaboration. Most clients seem bent on the idea of SCORM*[1] *and tracking student activity. There is little emphasis on learning*".

ID2 gives a slightly more positive view, although this is in direct contrast to the three examples he gave of courses developed and educational theory used:

[1] SCORM - Sharable Content Object Reference Model, whereby content is stored in such a manner that it is re-usable in different systems and delivery to learners can be controlled according to predefined sequences and delivery dates. If used extensively it can be linked to online assessment such as multiple choice type questions. For additional information on SCORM see the Advanced Distributed learning website with ADL Guidelines available online at http://www.adlnet.gov/downloads/AuthNotReqd.aspx?FileName=ADLGuidelines_V1 PublicComment.pdf&ID=320 and the Learning Technology (a publication of IEEE Computer Society) site available online at http://lttf.ieee.org/learn_tech/issues/january2005/index.html.

> *"In general, our advice is heeded but there are occasions that non-educational business people have set ideas and then it is necessary to be firm and insist on the correct approach. Sometimes you win and sometimes you have to compromise to get the deal".*

This is in line with the conclusions in the educational expert review section whereby clients preference, no matter how well intentioned or misinformed, are likely to take precedence over expert opinion.

When asked about examples of authentic tasks ID3 misses the point entirely giving the following as examples:-

> *Formative assessments/Assignments, Summative Assessments/Assignments, Questions: True/False, Yes/No, Multiple Choice, Quiz*

ID2 says of the three courses that the one had no authentic tasks but "*samples of the invoice and what the learner would be exposed to was displayed*", the other uses a "*comic metaphor so does not use any authentic tasks*", but in one "*authentic tasks are used extensively such as creating a marketing plan and developing a [sic] interview template*".

ID1 talks of immersive simulations using a particular "*situation/context/scenario*" in which the learners are required to "*carry out actions*" and further states that feedback is given during the process.

Of the responses the immersive simulations appear to be the most appropriate to authentic task inclusion for constructivist educational scenarios. It is not clear if these take place within a realistic social context whereby different life views and cultural sensitive contexts are varied according to learner diversity. Despite the assertions of the respondents that they understand, and are sympathetic to the social constructivist learning theory, only ID1 appeared to understand the use of authentic tasks in learning.

4.3.6 Implementation and evaluation of the learning environment

In answering questions about formative evaluation both ID1 and ID2 stated they did formative evaluation of the learning environment with the clients during the development phase, and both did some "on the fly" changes when running collaborative learning courses. ID3 reported that formative evaluation took the form of assessments or assignments and multiple choice type questions, clearly misunderstanding the concept of evaluation of a learning environment as opposed to testing student learning.

During initial implementation ID1 states that it

> *"depends largely on the type of the course. If it is a collaborative course, there is usually a fair amount of communication with participants about the use of the environment. We usually conduct another round of error-checking once the courses have been implemented. This irons out any issue with unclear instructions, functionality, or usability issues".*

ID2 adds to this by stating they undertake "*the training of the clients staff*" and a general "*pilot is undertaken to ensure the system is running correctly*". ID3 states "*forums, either general forum for all learners to participate and share knowledge or task specific*" forums are used. Again, ID3 equates this with learner activities rather than checks of course design.

Post implementation follow-up
When asked if post implementation follow-up studies were undertaken, ID1 states that this usually happens but it is client dependent as "*some clients don't worry about it, although I feel it is important to get this feedback, especially from the learners*". ID2 took three courses into consideration, the one did not have post implementation follow up but two other courses received feedback from clients and learners with changes made to the system such as technological changes to accommodate poor bandwidth problems. ID3 once again mentions assessment of learners stating "*summative assessments / assignments*" were used.

4.3.7 Suggestions from Instructional designers

ID1 would like to see a *"blend of models with looser adherence to such models …. (as) strict adherence to such models often seems to create inflexibility for the varying needs of learning situations and topics".* ID2 states "*increased rigour in the communication between the design company and the client is essential as they (the clients) often do not have an idea of what it takes to build successful learning interventions*". ID3 recommends that a model should ensure that the designers "*engage with a subject material expert from the outset of a project*" and "*a simple learner contract to be signed ensuring the buy-in of the learners' commitment*".

4.3.8 Conclusion of data from Instructional Designers

There are clearly different levels of understanding of Instructional Design and learning theories reflected by the respondents, and thus the instructional design model may need to be more explicit about various theoretical applications than would normally be considered desirable. In addition it appears that not all designers are familiar with the legislative requirements of accredited courses in South Africa. This would need to be explicitly stated in the instructional design model.

Some attention to the types of authentic tasks and collaborative learning activities should also be spelt out, with indications of how different instructional strategies can be applied to include various learning styles. In particular, not enough attention is given to special needs in the design process and a check list of strategies to accommodate these could also be included.

Particular note is taken of ID3's advice to include a subject matter expert from the outset of the course. In addition stress must be placed on continuous evaluation of the learning environment by the learners themselves.

ID1's detailed process of development in question 1 will also inform the design of an instructional design model.

4.4 Subject Matter Experts responses

Subject matter experts were also interviewed as they are key stakeholders in the development of training material, however they are often experts within their field rather than pedagogically trained to facilitate learning. The guiding questions are outlined in Appendix D.

Table 8: Subject Matter experts included in the sample

Research participant	Stated e-learning experience
SE1	Call centre training and quality assurance.
SE2	Currently working with a "technology company who is putting course material online" at SETA qualification level 4.
SE3	Developing online course with an "instructional designer from our Online Learning provider using the SAQA requirements and my knowledge of the … industry as my guidelines".

4.4.1 Perceived difference between e-learning and face-to-face courses

In order to understand more fully how Subject Matter Experts viewed e-learning, they were asked how it differs from face-to-face courses. It was particularly interesting that all respondents felt that e-learning allowed better management and control, suggesting that this is a major concern among corporate training sections.

SE1: *"better … management. Ensures better control*"
SE2: "*offers streamlined management and control systems*"
SE3: "*Face-to-face learning requires the course facilitator to keep track of the learners' records whereas e-learning provides record keeping and other control systems*".

On a more positive side SE1 thought e-learning could offer better facilitation and SE2 was positive about "*flexibility of venue and time and pace of work*". However SE2 also expressed concern that the facilitator was not physically present in an e-learning environment

> *"Face to face allows the facilitator to develop knowledge of the learner to a greater extent than e-learning. Face to face allows a facilitator to gently include and extract participation and information from a reticent learner. This can be done to a lesser extent online, but there is less personality interaction. Body language cannot be read online".*

This is supported by Reeves and Hedberg (2003: 271) who claims that developmental studies should have amongst other objectives, "creative approaches to solve human teaching, learning and performance problems". In this context, e-learning is used in the SA corporate sector to solve the logistical issues and lack of access to learning by the workers.

4.4.2 Legislative needs

SE1 does not deal directly with these matters, but delegates Human Resources and Training to do so. SE2 states that her duties include, keeping abreast with changes in policy, checking the qualification is current, moderation of course material before delivery, checking the scope and qualifications of INSETA registered facilitators, assessor and moderators, moderate a 25% sample of learners portfolios of evidence, complete a moderator's report and undergo verification processes by the INSETA. SE3 gives less detail than SE2, but includes keeping up-to-date with SAQA and INSETA requirements, adherence to the requirements and submission of learner records for accreditation.

Mappin et al (2004: np), advocates for the- identification of relevant subject matter and tasks aiming at fulfilling learning objectives which is in line with SAQA regulations. Seels and Richey (1994: 127) are also in line with this in saying that "….processes and products [e-learning course development and implementation] must meet the criteria of internal consistency and effectiveness". SAQA and SETA regulations are there to ensure provision of quality and accredited lifelong learning.

4.4.3 Cultural needs

All respondents indicated that their courses are conducted in English as they perceive this to be the discourse of business. SE2 states "where there is a language barrier, informal help is available where possible from a mother tongue speaker" but SE3 emphasizes that it is impossible to use "all the South African languages because of the cost factor". Both SE3 and SE2 specify that the learning content is based on the "day-to-day lives of all South African people" and SE2 adds that "discussion

groups are vital for exchanging opinions and showing differing attitudes" and that "respect for others is essential even where opinions differ".

This is in line with Savery and Duffy's (1996: np) constructivist approach to learning instructional principles of designing authentic tasks which he describes as tasks that are "relevant to the way people live, they could relate to their cultural beliefs and their values". Mueller (2006: np) argues that authentic tasks are a best practice for designing e-learning because "they give the learners an opportunity to create their own responses rather than simply selecting from the preordained ones". One of the ten guidelines for authentic tasks given by Reeves, Herrington and Oliver, 2002:np) is that authentic tasks should have "real-world relevance".

4.4.4 Accessibility for differently-abled learners

Only SE2 indicated that some attempt were made to be inclusive stating "access to face to face venues or online learning is not a problem" and "where there is further need … every reasonable effort will be made to address it". However, this response appears to take into consideration mobility challenges as addressing the needs of the blind and deaf would be far more complex and require prior planning. SE1 is more explicit on this issue stating "none of our material meets their needs – we don't even use audio". Both SE1 and SE3 state that this should be incorporated in future developments.

In terms of the instructional design model it may be useful to indicate how these needs can be addressed and tested in developing an e-learning course.

4.4.5 Educational theory

Subject Matter Experts are usually selected for their understanding and knowledge of the topic and there is usually no requirement for them to have received formal educational qualifications. Piskurich (2000: 09) and Kanuka (2002: np) recommend that learning designers and pedagogical content experts who have teaching experience should work together to avoid having conflicting instructional strategies. Thus it was expected that they work with e-learning specialists to ensure a pedagogically sound learning environment. All three respondents felt that this was necessary, however of particular interest was SE2's responses, where she states the "e-learning specialists need to tailor their processes to meet INSETA's requirements". Clearly should there be a difference of opinion the INSETA specifications would take precedence over the e-learning developer's advice.

4.4.6 Implementation and evaluation of the learning environment

All three respondents felt that it was part of their responsibility to monitor the courses, SE1 stating that they assess the course in conjunction with the outsource partners,

SE2 through moderating the material before delivery, moderating the assessed portfolios and by observation in the classroom and tracking of group work such as the online discussion forums, SE3 reviews the material before forwarding it for INSETA certification and states that “it is essential for me to get involved since I have the knowledge of content”.

Post course assessment is less formally integrated. SE2 states it normally takes place “during the learning event” and that the is “informal feedback after the event about their success in finding jobs or applying the knowledge in the workplace”, SE3 states that the learning process “is part of staff development” and learners are subsequently “given extra tasks to that they make use of their new[ly] acquired skills”. SE1 however feels that they already follow up as they “do regular checks and ... have meetings with them”. In future developments they wish to start “measuring the impact of this on the performance…”

Some formal post training assessment for in-house training could be formalized in the instructional design process and duties assigned to specific members of the team to collect the data.

4.4.7 Evaluation /Assessment of learning

When asked if they participate in the assessment of learning, one of the SMEs stated that she was not qualified to perform the assessment task, one said “yes we do internally and with our outsource partners” and the other said “yes, by moderating the material before delivery, by moderating the assessed portfolios and by observation in the classroom and tracking of group work like online forum discussions”. According to Trivedi (undated: np), Cooper (2000) and Harrison and Bergen (2000) both formative and summative assessment form a fundamental element of learning. Proper assessment techniques allow the learner to keep track of their performance in an “effective and traceable form”.

4.4.8 Transfer of acquired knowledge and skills

According to INSETA (2008: np) lifelong and authentic learning are aimed at ensuring the learning provided to the learner enables them to be “adaptable and changeworthy and continually employable and marketable because of learning new job skills”. These aims can only be achieved if learning is designed to facilitate the acquisition of relevant knowledge and skills to be used for the development of the learner. The two SMEs indicated that they made an informal follow-up on the learners: “there is informal feedback after the event about their success in finding jobs or applying the knowledge to the workplace”. Whereas, the other SME pointed out that they “do regular checks and we have meetings with them” they further said: “…in the 2nd phase to start measuring the impact of this [e-learning] on the performance on our business”. This is commendable because it shows that the

company is prepared to identify their strengths and weaknesses enabling them to plan how to improve their learning design and delivery.

4.4.9 Suggestions from the Subject Matter Experts

SE3 stresses the need for instructional designers to work “hand in hand” with Subject Matter Experts, while SE2 considers the administrative and feedback processes should be easier in the online environment and that “streamlined recordkeeping system[s] of submissions, results etc will help a lot”.

4.4.10 Conclusion of data from Subject Experts

Subject experts play a vital role in the development of any learning and this includes e-learning. In addition these respondents clearly take on much of the responsibility of assessment and ensuring legislative compliance. However, care should be taken that a balance be created between the administrative and legislative needs expressed here and the learning experience by the learners themselves

4.5 Learner feedback

At the inception of this research the intention was to follow up with the e-learners to understand more fully their experiences. Unfortunately, companies were either reluctant or unable to give me access to their learners. This is in keeping with Jaffe (1989) and Dagada and Jakovljevic (2005) concept that companies are reluctant to give out information that may give away their competitive edge and thus financial advantage. Although I made representation in such a way to assure the participating corporations that I had no intention of “stealing” their clients or divulging confidential information, no one was prepared to give me contact details. This is not surprising as each participant from companies indicated that they had to seek permission from their employers before agreeing to participate in this project

Unfortunately this does call into question aspects of validity as the most important source of information about any learning environment has to be the learners themselves. However, the importance of gaining this information can be emphasized in the design model and followed by the companies.

Chapter Five: Development of a Model as a Solution

5.1 Introduction

Having outlined the best practices and theoretical framework by reviewing current literature and reviewing current practices in the South African corporate sector, the next step of a development research would be to develop a solution. This was done bearing in mind the following findings from the previous chapters.

5.1.1 Qualifications of practitioners

Not all practitioners are qualified educationalists so the model should incorporate best practices without being overtly theoretical. While it would be preferable to have a conceptual design model this could be considered difficult for some practitioners. The model developed was based on the LAD conceptual model but further expanded to include procedural steps that could be modified for specific courses and needs.

5.1.2 Constructivism versus instructivism

One of the major advantages of e-learning environments is clearly the possibility of encouraging a constructivist learning philosophy; however the course reviewers indicated that not all courses developed will be best served by this learning theory. The model developed encourages the use of relevant activities and tasks, the sharing of prior knowledge and peer reviewed exercises, but allows for modification depending on the specific course. The most important aspect is to encourage developers to be aware that learning is more than the presentation and regurgitation of notes on the web.

5.1.3 Learning through activities to support theoretical knowledge

The data collected reveals that there is a need for learning designers to ensure that each learning environment has authentic, 'real-world' learning activities to provide experientially based learning linking the practical skills with the theory. The designed model places the learning activities at the core of the design model. It is important that the learning facilitators keep themselves updated on the corporate trends and modify the learning activities to address those current trends.

5.1.4 Need for a traceable recordkeeping system

The Subject Matter Experts and corporate trainers interviewed were adamant that there was a need for an "effective and traceable form" of keeping the learners' records. Therefore the model has an area that addresses the record keeping element. Record keeping is crucial because it facilitates proper proof of assessment, accreditation hence quality assurance. This feature needs the learning provider to

keep themselves up-to-date with the national and global learning providers' regulations.

5.1.5 Testing and re-testing of the learning environment

Most e-learning courses tend to be designed giving no adequate room for pilot testing the portal before it is released to the learners. The testing that normally takes place is technical and therefore focuses on functionality and not whether the learning design facilitates acquisition of learning. The designed model makes pilot testing and continuous testing an important function for the learning designers and facilitators. This did however raise concerns for contract developers who require a "hand-over" time, or they could add a modification charge into the contract.

5.1.6 Incorporation of special needs in the learning design

The research revealed that most of the respondents had not considered the learners with special needs or differently-abled learners when designing learning courses. Advice to consider these needs is in the model as well as recommendations to include differently-abled people on the testing team.

5.1.7 Access to ICT

As indicated in the model, the e-learning designer in the corporate sector will have to consider issues of accessibility to computers with internet. Will the e-learners be studying using company facilities? Is it going to be during office hours, or after hours? Providing the learners 24 hour access to their offices or computer lab may need reworking the security setup with the management. The designers are asked if this can be done? Allowing all employees time to learn during office hours could affect productivity hence need for proper coordinated learning plan.

5.1.8 Level of ICT competence

This research study is on e-learning in the corporate sector which means that courses will be run online. It is crucial for the e-learning design team to think about the learners' levels of computer and internet literacy. Learners may need to find information online, link with other learners for group activities. One Learning Designer who reviewed the SAeLAD model indicated that:

> **"**Very important. With CompanyX I had to do a course to introduce the trainers to online learning so they would understand it".

However, linked to this is the course facilitators' level of literacy as well. Facilitators may need to guidance on using the tools available to support the learners effectively.

5.1.9 Learner motivation

A course that deals with changes in technical or procedural issues may benefit from change management techniques. For example, the learners can discuss how this procedure or technical intervention will assist them in their duties and make suggestions for improvement. The learners will get motivated by their perceived benefit for undergoing training. The way e-learning is designed also determines the learners' level of motivation. Facilitators will need assistance in changing their "teaching" approach to encourage learner motivation.

5.1.10 Prior experiences of learning

Obtaining this information, forming part of the 'needs analysis' from the learners would help inform the learning designer about the learning approach that will work better in facilitating learning for the individual learners. It is important though for the needs analysis to be worded in a way that all the people understand what is asked of them; for example, instead of asking them what learning theories (most people might not know what learning theories are unless if they are educational experts) were used to teach them before; they can be asked what subjects did they excel in and how did the "teacher" facilitate their learning.

5.1.11 Prior knowledge

The constructivist approach to learning recognizes that each and every learner has prior knowledge. This knowledge could directly relate to their current field of study or contribute towards the given learning activities. Therefore, it is important for the learning design to allow for the acknowledgement of the learners prior knowledge. This can be done through asking detailed and relaxing questions that will make the learner tell how much they already know and what their areas of uncertainty in the field of study are, as well as draw in current practices that can be changed or benefit from the material being learnt.

5.1.12 Cultural backgrounds and language skills

Culture plays a very important role in motivating people to accept or reject what they are offered. The use of learning activities makes a positive contribution towards purposeful learning (Beetham and Knight, 2004). The learning designers should ensure that the learning activities they designed are not offensive to a particular group of learners. The language used should be understood by all learners and if there are any learners with special needs like screen readers or voice recognition devices, the courses should be suitable designed and arrangements for the adaptive technology should be made in due time.

5.1.13 Roles and responsibilities of the design team

The design of a corporate learning course is usually a team effort. It is important that each member of the team is aware of their specific role and takes responsibility for it. To aid this process each activity in the procedural guide requires acceptance of the roles and sign off on completion. This should foster management of the process by external designers and indicate to management the complexity of the design process.

5.2 Developing the proposed e-learning design model

From a practical point of view the model was developed as an MsWord document as all participants in the research used MsWord (Appendix F). Consideration had been given to creating a database version for use but this would have limited participants' access and ease of modification. It was considered important that each person using the model feel able to adapt it for their own needs both immediately and later as they became more familiar with the requirements. Where explanations were felt to be necessary these were put into blocked text which could be deleted easily for each working model.

A draft design was sent to instructional designers for review and comment. Their comments on the conceptual aspects of the model are discussed below and where typographical and minor alterations were requested these were included or corrected in the model.

5.3 Feedback on the model and the research questions

The model was reviewed by four practising e-learning designers who generally gave positive feedback, with one reviewer stating it was "the most practical and thorough model" he had seen for his specific needs. Concerns raised by the reviewers have been incorporated in the final version where possible. One reviewer was most concerned that the model did not have a unique identifying name and thus the acronym SAeLAD was used to denote South African eLearning Activity Design.

The feedback to the model is reported here in relation to the underpinning research questions.

1. **Getting a proper understanding of South African corporate training needs**: The four e-learning designers agreed on the importance of first doing skills gap, needs analysis and/or get a stable and properly e-learning trained personnel to implement e-learning in the corporate sector. FMR1 and FMR2 also mentioned the importance of learner-driven and clearly stated learning goals making it easier to know how to structure the learning process.

2. **The differences between training, education and academic learning and learning theory**: the e-learning model gives the learning designer a chance to choose which learning design theory or approach they would want to employ. FMR1 suggested that instead of focusing on learning theory which some self taught e-learning designers and subject matter experts might have a proper understanding of, rather the model should focus on instructional strategies as prescribed by Dick and Carey (1996), Dagada and Jakovljevic (2004) and Ekwensi et al (2006) in the literature review. They call for the use of either one-on-one mentorship; forum; small group work; projects; collaborative learning; case studies and simulations; learners' contracts; discussions; lectures, tutorials and drill and practice and self-directed learning. Willingham (2006), Ogle (1997) and Laurillard (1993) call for the skills developers in the corporate sector to refrain from 'training' the workers but to incorporate 'education' and 'academic learning' in their skills development strategy.

3. **The model aims at highlighting the academic e-learning best practices and the possibility of their integration into e-learning design in the S.A. corporate sector**: FMR 1, 2 and 3 all agreed that Trivedi's prescribed areas of e-learning best practices which are course planning; technical infrastructure and support; instructor/facilitator training; initial online class orientations; diversity of instructional/learning material; course structure; student assessment and course evaluation are 'issues of real importance' when designing the best e-learning courses. On issues of determining what level to set the e-learning portal with regards to prior knowledge, and experiences, specific skills set, FMR2 stated that "it can be done when interviewing...you can then divide the class into levels (novice/experienced)...".

4. **Instructional design models:** The research study gave each research respondent a chance to reflect on the type of instructional or learning design model guides them in e-learning design. FMR 2, 3 and 4 said they normally used the ADDIE and their self-taught personal experience and FMR uses a combination of ADDIE and other models depending on the task at hand and the brief from the company requiring e-learning design. After they reviewed the SAeLAD they stated that they were going to make use of it in designing e-learning for the corporate and any other sector.

5. **South African legislative requirements**: Conducting the research study revealed that some companies take cognizance of the general and legislative requirements like SETA regulations when designing their e-learning. Some of the research respondents stated that they were not even aware of these specific regulations and requirements. Nevertheless, they all agreed that their e-learning design should incorporate a traceable recordkeeping system to effectively facilitate the assessment and accreditation process.

6. **The invisible and inefficient use of the constructivist learning approach** and the e-learning tools is evidence that most e-learning users do not have adequate understanding of educational theory and practice that best incorporates all the tools that can be used in an e-learning environment. As Amory (2006) comments that most people ignore the importance of developing their educational theory expertise when designing e-learning.

5.3.1 Concerns raised by reviewers

1. FMR1 felt that the model was not reflecting the specific "target user group" but it is not clear what is meant by this. He also suggested that the use of the word "intended" would minimise the limited focus of the model.

2. FMR 1 also made mention of a need for a brief and storyboard before resources are assigned "because you don't know beforehand what skills you will need...it is very much based on what you need developed". The "brief" is covered in the original model under item 1, an additional story board could be included in the model but this would be dependant on the type of development being made (most useful when rapid prototyping is not available). The model can be adjusted for additional skill sets if necessary.

3. FMR2 raises the concern that over pitching the language in the e-learning design "can kill" the learning purpose.

4. FMR1 raised a concern about the difficulty in implementing constructivist learning in e-learning environments, this is reflected in the data collected whereby most respondents expressed the view that constructivism was not clearly implemented in the corporate e-learning portals they reviewed. In terms of FMR1 the "...model [should be made] broader, perhaps consider incorporating other approaches too, such as standalone e-learning packages – click, click, click types. Not the best, but that is the reality of what is out there". However, this is precisely the type of development this model was trying to avoid, and it was specifically developed to try and address the added benefits brought about by communication options available in online learning.

5.4 Limitations of the study

The study was limited by various practical issues. Collecting data from a place where 'time is money' proved to be a difficult exercise; interviews could not be conducted because people were not willing to spare their precious time. As most companies, like the BANKSETA, have their headquarters in Gauteng, the best form of communication was telephonic and email which limited the effectiveness of communication. The use of e-learning for training in the INSETA is a fairly new trend; this made the research respondents give limited views on e-learning best practices.

Similarly, the notion of instructional or learning designers is also fairly new in the South African corporate sector and therefore there is a limited view of the role these instructional designers have in corporate e-learning development. Finally, for the most part, it is very difficult to implement constructivist learning environments in the corporate sector, because there is no buy-in by SETAs, management and trainers as yet. In addition company rules for access to technology and their ICT security restrictions do not allow all employees easy access.

5.5 Recommendations

This research would have benefited from studying the model in use, however time constraints and lack of access to design teams did not allow for it. In addition, a research of this nature should include a learners' perspective. Further research into both developers and learners' perspectives especially in the use of this model would add value.

5.6 Conclusion

In terms of Reeves and Hedberg's (2003) advice to be clear about one's research goals, the development research goal to develop an instructional design model for e-learning in the South African corporate sector has been met. In doing so it has been interesting to note that, bar some idiosyncratic legislation, many of the challenges facing corporate e-learning development is similar around the world as highlighted by authors such as Urdan and Weggen (2000) and discussed in Chapter 1 of this dissertation. However, a distressing observation is that developments in South Africa tend to overlook "special" needs such as those for disabled users, or culturally diverse groups, when simple awareness of the needs and the technologies available could make this an easily incorporated feature.

The most commonly faced challenge for progressive e-learning development will be to encourage the buy-in from management, many of whom only experienced an instructivist model of education. It is this group that ultimately have the last say in the educational philosophy used as they pay the piper.

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Appendices

Appendix A: Ethical approval certificate

RESEARCH OFFICE (GOVAN MBEKI CENTRE)
WESTVILLE CAMPUS
TELEPHONE NO.: 031 – 2603587
EMAIL : ximbap@ukzn.ac.za

UNIVERSITY OF
KWAZULU-NATAL

12 NOVEMBER 2007

MS. SA NGUBANE (205524922)
CREATIVE ARTS, COMMUNICATION & MEDIA STUDIES

Dear Ms. Ngubane

ETHICAL CLEARANCE APPROVAL NUMBER: HSS/0655/07M

I wish to confirm that ethical clearance has been granted for the following project:

"Development of an instructional design model for corporate e-learning in South Africa: An e-learning best practices case"

PLEASE NOTE: **Research data should be securely stored in the school/department for a period of 5 years**

Yours faithfully

PXimba
.....
MS. PHUMELELE XIMBA
RESEARCH OFFICE

cc. Post-Graduate Office (Lyn Marriott)
cc. Supervisor (Ms. K Murrell)

Founding Campuses: Edgewood Howard College Medical School Pietermaritzburg Westville

Appendix B: Participants' consent form

The following statement was acknowledged by all participants and included in questionnaires and reviews

Ethical clearance:

I _____agree to participate in this evaluation study. I do understand that I have every right to withdraw from such participation at any time. My agreement is on understanding that my identity will be kept anonymous.

_____ _____

SIGNATURE OF PARTICIPANT DATE SUBMITTED

Appendix C: Educational expert review checklist

How to return the completed evaluation form:
Save the document “yourname_coursename.doc” and e-mail it as a Word document attachment to email to be supplied

Ethical clearance:

I _____agree to participate in this evaluation study. I do understand that I have every right to withdraw from such participation at any time. My agreement is on understanding that my identity will be kept anonymous.

_____ _____
SIGNATURE OF PARTICIPANT DATE SUBMITTED

Coursename Online Learning System

Reviewer’s name:

Date submitted:

Please click on the box to indicate your rating.
1 represents the lowest and most negative impression on the scale, 3 represents an adequate impression, and 5 represents the highest and most positive impression. Choose N/A if the item is not appropriate or not applicable to this course. Type any additional comments below the comment heading for each question.
NA=Not applicable, 1=strongly disagree, 2=Disagree, 3=neither agree/nor disagree, 4=Agree, 5=strongly agree

AREA 1 - INSTRUCTIONAL DESIGN REVIEW	N/A	1	2	3	4	5
1. E-learning is being properly designed to facilitate learning in the corporate environment.	☐	☐	☐	☐	☐	☐

This *Coursename* Online Learning System states the learning objectives precisely.
Comment:
Type your comment here

2. The instructional design of *Coursename* Online Learning System is based on sound pedagogical philosophy. ☐ ☐ ☐ ☐ ☐ ☐
   Comment:
   Type your comment here

3. The design is based on the social constructivist pedagogy. ☐ ☐ ☐ ☐ ☐ ☐
   Comment:
   Type your comment here

4. The content in the site is logical, addresses a specific theme and conforms to the SAQA and SETA requirements. ☐ ☐ ☐ ☐ ☐ ☐
   Comment:
   Type your comment here

5. The pace of *Coursename* Online Learning System is appropriate for the tasks and facilitates lifelong learning. ☐ ☐ ☐ ☐ ☐ ☐
   Comment:
   Type your comment here

6. The *Coursename* Online Learning System allows for appropriate interaction amongst the learners. ☐ ☐ ☐ ☐ ☐ ☐
   Comment:
   Type your comment here

7. The *Coursename* Online Learning System provides metacognitive support ☐ ☐ ☐ ☐ ☐ ☐
   Comment:
   Type your comment here

AREA 2 - COSMETIC DESIGN REVIEW N/A 1 2 3 4 5

8. The screen design of the *Coursename* Online Learning System follows the instructional design principles. ☐ ☐ ☐ ☐ ☐ ☐
   Comment:
   Type your comment here

9. Colour is appropriate for the online learning system ☐ ☐ ☐ ☐ ☐ ☐
   Comment:

AREA 2 - COSMETIC DESIGN REVIEW		N/A	1	2	3	4	5
	Type your comment here						
10.	The colour accommodates the colour-blind users. Comment: Type your comment here	☐	☐	☐	☐	☐	☐
11.	The screen displays are not cluttered Comment: Type your comment here	☐	☐	☐	☐	☐	☐
12.	The *Coursename* online learning system is easy to navigate Comment: Type your comment here	☐	☐	☐	☐	☐	☐

AREA 3 - PROGRAM FUNCTIONALITY REVIEW

13. The *Coursename* Online Learning System operates faultlessly ☐ ☐ ☐☐☐ ☐
Logins work
Download time adequate
Browser compatibility (please state which browser you use)
Server is always available

Additional comments (This study aims at developing an Instructional Design (ID) model for the South African corporate sector, therefore your expert comments will be highly appreciated).

_____
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Thank you for taking part in this evaluation

Appendix D: Instructional Designer Interview Schedule

Introduction
The intention of this research is to develop an Instructional Design Model that can be used by people developing corporate e-learning courses in South Africa.
This interview form is designed to interrogate current practices among instructional designers of corporate e-learning portals to get a sense of what is been done currently and identify key areas that should be covered in a useful Instructional Design Model.
If you are willing to participate please fill in the required informed consent form below: Note that unless you give written permission your name and company affiliation will be confidential, your participation is entirely voluntary and no financial or other benefit will be offered to you for your participation. However, if you would like a copy of the research document (dissertation), executive summary and/or the Instructional Design Model at the end of the process one please indicate below and one will be forwarded to you.

Informed consent:

I _____agree to participate in this evaluation study. I do understand that I have every right to withdraw from such participation at any time. My agreement is on understanding that my identity will be kept anonymous.

I would like a copy of (please tick appropriate box):

Full dissertation	
Executive summary	
Instructional Design Model	

_____ _____

SIGNATURE OF PARTICIPANT DATE SUBMITTED

Interview schedule

Participant's name (voluntary):
Contact details so documents mentioned previously can be forwarded you (optional):

1. Are you currently involved in the development of e-learning courses for South African companies? Please state what your role is.

2. What procedures do you follow when undertaking these tasks. Please give a detailed description from the first step to completion. (Use an additional sheet of paper if necessary)

3.a. Most countries have statutory (legal) requirements for recognised training courses. Which South African ones are applicable to your developments?

3.b. How do you ensure that these requirements are met?

4. South Africa is a multi-cultural multi-lingual society; do you heed these issues when developing your courses?

5. There are legal requirements that address the needs of disabled people in the workforce. Do you develop your material with these special needs in mind and if so what steps do you take to ensure they are met?

5.a. Are you familiar with the latest educational theory related to e-learning? If so which aspects do you incorporate into your designs?

5.b. Is your advise in this area always heeded or are you sometimes asked to develop courses that are contrary to your perception of best practices. Please give examples.

5.c. How are authentic tasks incorporated into virtual learning environments such as those that you develop? Please give examples.

6. What formative evaluation steps are taken during the design process?

7. Are there specific tasks conducted during initial implementation?

8. After implementation do you conduct follow up studies?

9. Do you have any suggestions regarding the development of an Instructional Design Model which you think would assist you in the work you do?

Thank you for your input.

Appendix E: Subject Matter Expert Interview Schedule

Informed consent:

I _____agree to participate in this evaluation study. I do understand that I have every right to withdraw from such participation at any time. My agreement is on understanding that my identity will be kept anonymous.

I would like a copy of (please tick appropriate box):

Full dissertation	☐
Executive summary	☐
Instructional Design Model	☐

_____ _____

SIGNATURE OF PARTICIPANT DATE SUBMITTED

Participant's name (voluntary): _____

Contact details so documents mentioned previously can be forwarded you (optional):

_____

_____

_____

1. Are you currently or have you ever been involved with the development of an e-learning course? If so please give a description of the courses you have been involved with?

_____

_____

_____

2. In your view do e-learning courses differ from face-to-face courses? If so in what way?

_____

_____

_____

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_____

3. As a subject expert are you involved with ensuring the SAQA[2] and SETA[3] requirements are met? If so what steps do you take to ensure this?

_____

_____

_____

_____

_____

[2] SAQA: South African Qualifications Authority

[3] SETA: Skills Education Training Authorities

4. How closely do you work with the e-learning specialists? Do you feel your concerns are met?

_____

_____

_____

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_____

5. South Africa is a multi-cultural multi-lingual society, does the material take this into consideration?

_____

_____

_____

_____

_____

6. There are legal requirements that address the needs of disabled people in the workforce. Do you develop your material with these special needs in mind and if so what steps do you take to ensure they are met?

_____

_____

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_____

7. As subject matter expert do you participate in the assessment of learning?

_____

_____

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8. How is accreditation awarded both to the course and those successfully completing the course?

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9. After participants have completed a course do you follow up with them to see if they have been able to transfer their new knowledge into the work environment?

_____

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10. Do you have any suggestions regarding the development of an Instructional Design Model which you think would assist you in the work you do?

_____

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_____

_____

Thank you for your input.

Appendix F: Instructional Design Model (SAeLAD)

SAeLAD

E-learning design model for South Africa corporate environment

Introduction

This model attempts to take into consideration a number of factors in South Africa corporate learning environments not all of which will be applicable to every course. It is thus designed as a template and the non essential items can be removed for any specific project. In addition it should be easy to add elements as laws, technology and/or environments change.

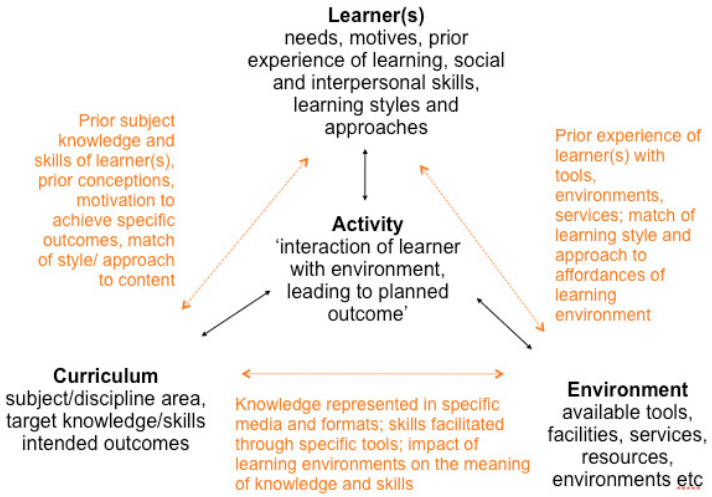
Where comments or guidelines are informational they are placed in grey shaded tables (such as this introduction) and can be deleted once the design team is comfortable with the concepts. Many companies use people with vastly different skill sets to support their learning, in order to be as inclusive as possible the template is very explicit so that all people, no matter their area of expertise, should be able to follow the system. As each team becomes more familiar with the different roles and tasks the descriptions can be deleted from the template.

The theory behind the development of this model

There are two types of models used in instructional design; the conceptual and the procedural.

Conceptual Models

According to Richey (1990: 124) a conceptual model is 'descriptive and experience-based' which should 'facilitate an understanding of those factors which impinge on designs and their implementation' (Richey 1990: 131), but should be flexible enough to adapt to new systems and knowledge. The conceptual model that forms the basis of this document is the Learning Activity Design model (LAD) which places learners at the apex of the system and learning activities as the most central component. Also note that in the diagram on the right each task is linked with both forward and backward arrows indicating that each identified task has a co-dependant relationship with the others and no task can be completed in isolation.

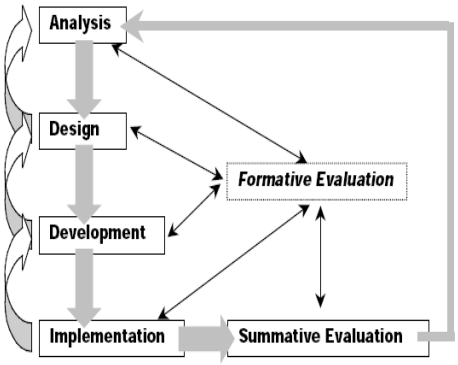


(Beetham, 2004: 05)

Procedural Models

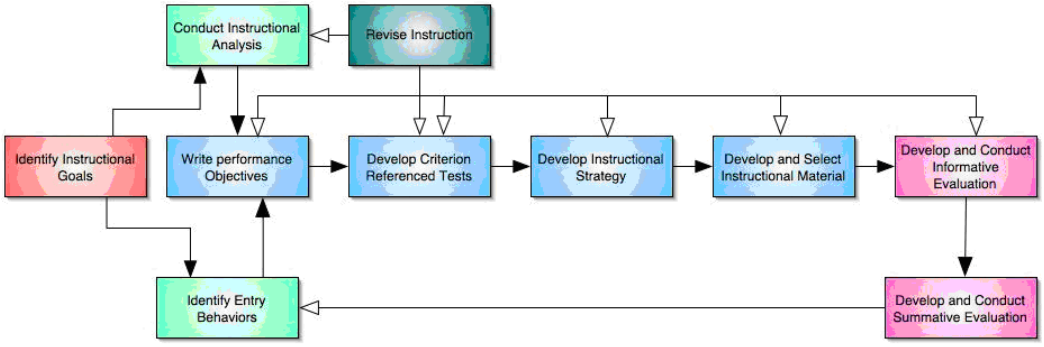
Richey (1990: 124) states that procedural models provide 'specific guidelines on how to carry out the design project' and it should provide details of how to execute each given task.

One of the most commonly used procedural model is the Analyse Design Develop Implement Evaluate model more commonly referred to as the ADDIE Model. The strategies applied in this model are depicted in the image to the right of this text, where again there is a co-dependence between the tasks and at the centre of the system is the need for formative evaluation, checking each of the tasks against the others as the system is developed. Notably the difference between the conceptual LAD model and the ADDIE model is the "summative analysis" of the ADDIE model. The conceptual model recognizes that no course remains static and the process of design and modification is perpetual.



ADDIE (adapted from McGriff 2000:01)

A more detailed process is described in the Dick and Carey Model



(Clark, 2004: np)

Both these models are task orientated and procedural but the Dick and Carey Model is more specific about each task to be carried out during the process. A combination of all three models described above, are used to inform the design of this model.

Corporate South African factors taken into consideration in the development of this model.

Corporate training in South Africa is often motivated by a combination of factors; a change in either technical or administrative operations and/procedures, staff induction for new recruits, or staff development often in compliance with the Skills Development Act. Usually it is initiated by management and a brief given to training personnel or the Human Resources division who, in turn, may outsource the training.

In developing these training interventions it is also important to recognize that the developers, facilitators and the participants themselves are likely to come from diverse cultural, linguistic and educational backgrounds. In addition some of the participants may have special needs and thus learning environments should cater for people who are blind, visually impaired, mobility challenged or hearing impaired.

The following sheets are intended to highlight the recommended procedures for the development of a course with an emphasis on e-learning courses, although the process could also be useful for other types of courses such as simulations, or face-to-face training. It has been designed in such a way that people using it are encouraged to add to it, delete from it or modify aspects of it for their specific needs.

Proposed Course title: _____

1. Initial brief:

Usually management will give an initial brief to the training personnel; this brief should be documented and signed[4]. (Note this is usually in the form of identifying what Dick and Carey call the "instructional goals.")

_____

_____

_____

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_____

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_____

Identify if regularity/legal requirements should be met and if so the statutory body (for example the SETA) that does this and how these documented requirements match the management brief. Include a web site if possible so that this site can be revisited easily.

_____

_____

_____

_____

Signature of company representative/manager responsible:_____

[4] Signatures assist in various ways, they provide transparency for those giving for those giving the instruction or undertaking a task allowing access to the information and the ability to check that it is correct. It is also useful for those following the instructions as should there be disputes later the tasks can be checked against the original brief. It also creates mini-milestones that force the people who are not doing the development to stop and reflect on the progress of the project

2. Identification of the development team and assignment of roles and responsibilities:

Any development of a course or learning environment will have multiple tasks and different people have expertise in different areas. From the outset it is useful to identify who is responsible for each task. While it is useful to have 'experts' in each area this is unlikely and it is quite acceptable to have one person responsible for more than one task. Add additional tasks or reorganize the order of the tasks if necessary.

	Name	Signature
Project Manager/coordinator		
Instructional Designer:		
Subject Matter Expert		
Graphic Designer		
Accreditation		
Facilitator/s		
Line Manager		

3. Learner profile:

From the brief documented in item 1 above, give a description of likely learner profiles in terms of the elements identified but adding any additional elements as necessary. Information can be sourced from line manager HR personnel and course facilitators.

a. Cultural backgrounds:

Here include religious backgrounds as well as certain behaviours may be inappropriate within certain religions e.g. offering pork to Jewish or Muslim participants. Certain tasks may be perceived as generic fun, but are offensive to particular groups of people e.g. the game of snakes and ladders may be acceptable in certain circumstances and not in others (see for instance Andrews, S.J. (1994) where she comments on the colour of the snake and its association with ancestors). It is not possible for one person to be aware of all these issues, therefore it is important to have the material checked with members of the group as far as possible even if they are not on the official development team.

b. Language skills.

Although the medium of instruction is likely to be English, it is necessary to understand that some terms may require more careful descriptions if English is not the participant's first language. As far as possible get a person who is first language fluent in the home language of each participant in order to check the material for any possible misrepresentations or perceived offensive language, e.g. in older computer systems an error message typically read "abort, retry, ignore" - many people unfamiliar with different meanings of "abort" took offence (Shneiderman, 1987)..

_____

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c. Prior knowledge

Each learner will have different prior knowledge and experiences. It is not possible to identify all prior knowledge at the outset, however, if the learners have attended other courses these could be documented, and if the learners have a specified skills set for their current work environment these too can be documented. The course itself should draw on the learners to state prior experiences they have had in the field and later how the new knowledge will help them address those experiences.

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d. Prior experiences of learning

Very few people come into the workplace with no prior learning experiences and these will influence how they participate in a course. If learners have had good experiences feedback from the learners on the positive elements could be included in the development of the course. However, negative experiences also occur and these should be avoided. Examples that could be considered include learning theories, learning styles, different assessment tasks, authentic activities and group work exercises that have been well received in the past. If learners have not had experience with constructivist learning environments they may need more guidance than originally anticipated.

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e. Learner motivation

As far as possible identify why the learners will attend this course. If a course is mandatory and learners are instructed by management to attend, then learner motivation is likely to be very different from those attending a course on their own initiative to upgrade their skills and possibly benefit their career prospects. A course that deals with changes in technical or procedural issues may benefit from change management techniques being used (e.g. get the learners to discuss how this procedure or technical intervention will assist them in their duties and make suggestions for improvements). In addition find out if the learners will be given time and resources during office hours to complete the course or will they need to study in their own time – this will have direct implications for the pace of the course and possible delays in facilitator feedback.

Why?_____

_____

When? _____

_____

Expected motivation (intrinsic/extrinsic): _____

_____

_____

f. ICT competence

If the course is to be run online evaluate the computer literacy levels of the learners. Basic skills such as typing can influence the speed of responses, but in addition learners may need to find information sources online, link with other learners for group activities, save store and transfer information. If necessary introduce an e-learning orientation course.

Required computer competencies _____

Existing competencies _____

_____

Course Facilitator ICT competencies.
Does the course facilitator need additional help or training in the use of ICTs._____

_____

Course facilitator e-learning experience:
Is the course facilitator familiar with facilitator roles in online learning or should there be some induction for them?_____

_____

g. ICT access

What computers are available to the learners? Will they be working from home and if so what are the costs of linking them to the e-learning site? If they will be using company facilities after hours, will they be safe in their offices and travelling to and from work at odd hours? If they are being allowed to allocate work time to attend the course will this be the same time for everyone or will it be staggered? This will influence the use of certain tools such as discussion forums or chat sessions.

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Any other relevant information regarding learners could be added here.

_____

_____

h. Special Needs

Could any current or future learners have special needs? For example you may not have identified a blind person in your current learner profiles but in future a blind person could be employed to do a particular job where this training is required. If there is any possibility that this may happen then it is better to develop your site with this in mind from the outset. (Consider the needs of the blind, using a programme such as Jaws, people with mobility difficulties use voice activated commands and the deaf is some of the material is sound based).

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i. Special Needs

Is the team representative of the cultural groups and special needs groups in the target audience? If not identify a group of people (not necessarily part of the design team) who will check cultural and accessibility issues, ensuring that a member of each group checks development as it progresses.

Signature of extra team members indicating agreement to take on this review process:

_____

_____

Finally let each member of the design team review the learner profile and sign that they have seen it.

Learner profile reviewed and accepted by:	Name	Signature
Instructional Designer:		
Subject Matter Expert		
Graphic Designer		
Accreditation		
Facilitator/s		
Line Manager/HR		

4. Learning goals:

From the brief, and taking into consideration the Learners' profile list the goals and objectives in this course. As far as possible phrase these in tasks e.g. at the end of this course learners will be able to create a Power Point presentation, use non-invasive slide transitions, and present a talk on xyz. Identify authentic learning activities from the workplace for each learning objective and where possible ask them to discuss how these are applicable to their specific environments. Remember to move from the known to the unknown e.g. in the example above you could ask the learners to comment on an existing power point presentation and make suggestions for improvement. Ensure that elements of peer review and group collaboration are added to these tasks to foster a constructivist learning environment

Match each learning objective with the SAQA/SETA requirements if necessary.

Objective/goal description:	Task	Accreditation match
1.		
2.		
3.		

This should be agreed to by the Line Manager, Instructional Designer, Subject Matter Expert and the Facilitator

	Name	Signature
Line Manager		
Instructional Designer		
Subject Matter Expert		
Facilitator/s		

5. Identify record keeping requirements

Not all courses will require record keeping, but if the course is to be accredited this will be essential. Identify the necessary requirements from the SETA and any that the company may wish to keep especially in the light of the skills levy.

Requirements

_____

_____

_____

To be signed off by Instructional Designer, Subject Matter Expert and person responsible for accreditation issues.

	Name	Signature
Instructional Designer:		
Subject Matter Expert		
Accreditation		

6. Development of learning materials:

The development of learning materials must take into consideration the brief, the learners' profile and the goals and objectives of this course. There are several steps that can be followed

a. Existing material

Identify existing material, print based or on the web and analyse it according to the objectives and learner profiles. Document and where possible include copies in the development folder.

_____

_____

_____

	Name	Signature
Instructional Designer:	_____	_____
Subject Matter Expert	_____	_____

b. Develop new material

From the existing material develop new material to scaffold the learning according to the tasks identified in item 4 above. As far as possible make sure you offer different types of material to match different learning styles.

_____

_____

	Name	Signature
Subject Matter Expert	_____	_____
Instructional Designer:	_____	_____
Educational Expert	_____	_____

c. Create storyboard or prototype

Incorporate the new learning materials into a site which will display the structure and flow of the course. Depending on the technology being used this could be done as a “storyboard” or a prototype. Send for review to all team members including cultural representatives.

	Name	Signature
Instructional Designer:		
Subject Matter Expert		
Graphic Designer		
Accreditation		
Facilitator/s		
Line Manager		

d. Review prototype according to comments from reviewers

Depending on feedback from 5.3 above you may need to redevelop your storyboard, or re-conceptualize your learning goals. Reiterate this process until agreement is reached on the storyboard or prototype

e. Develop the learning site

Using the storyboard or prototype develop the learning site with assistance from the Graphic Designer and Instructional Designer as well as programmers if necessary. Send to the full team for sign off prior to running a pilot course

	Name	Signature
Instructional Designer:		
Subject Matter Expert		
Graphic Designer		
Accreditation		
Facilitator/s		
Line Manager		

f. Develop the record keeping system

Ensure that the system allows for record keeping as required in item 5 above.

	Name	Signature
Subject Matter Expert		
Instructional Designer:		
Educational Expert		

7. Pilot test of learning environment:

Offer the course as a pilot run to see if it is as effective as expected. Remember that it is likely to need modification both for general use and for specific groups. Feedback from the pilot study should be given by the course facilitator, the learners themselves and the person responsible for accreditation.

	Name	Signature
Course Facilitator		
Accreditation		
Subject Matter Expert		

8. Make revisions to the course:

Revise the course according to feed back received in item 6 above. Note that from this point on, after each course, feedback should be given and the course revised accordingly. No course, particularly as new information and requirements are made, can be considered final. As each revision takes place revisit the whole process as best practices and new technology may supersede what has been developed.

CORPORATE SECTOR INSTRUCTIONAL DESIGN TASK CHECKLIST

This checklist for the development of a corporate e-learning instructional design model is informed by the responses from the instructional designers that were part of the evaluation study from different companies in South Africa.

Key :			
	Instructional designer	-	ID
	Subject Matter Experts	-	SME
	Educational Experts	-	EE
	Facilitator/Trainer	-	F/T
	Graphics Designer	-	GD

Task Action	Executor	
1. Look for existing learning material, analyse it	SME, ID & EE	☐
2. Analyse the learning materials and find new ones	SME & ID	☐
3. Create a framework for potential topics and screens	ID & SME	☐
4. Review suggested changes	ID	☐
5. Develop media (animations, graphics, learning aids)	GD & ID	☐
6. Begin storyboard draft	ID & F/T	☐
7. Review of the storyboard	SME, EE & F/T	☐
8. Implement suggested changes	ID	☐
9. Send for sign-off	ID	☐
10. Create review exercises	F/T, SME & ID	☐
11. Send for sign-off	ID	☐
12. Implement suggested changes	ID	☐
13. Create major assessment exercise	F/T, SME & ID	☐
14. Make necessary modifications	ID	☐
15. Send for sign-off	ID	☐

16. Commence instructional design	ID	☐
17. Insert appropriate learning media	ID & GD	☐
18. Internal review takes place	ID, F/T, SME, GD & EE	☐
19. Modifications and report compilation	ID	☐
20. External review and modifications	Peer ID	☐
21. Send for sign-off	ID	☐
22. Implementation	ID	☐
23. Record keeping and follow-up reviews	ID, SME, F/T & EE	☐
24. Monitoring and ongoing evaluations for best practice	ID, F/T	☐

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