

Chapter 1

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1 Orientation

1.1 Introduction

In South Africa, like many other countries, unskilled labour is mostly used to perform the duties of warehouse operations in the supply chain management (SCM) environments. Main business areas are supported by several information technology systems that assist with the automation of procedures. Specified technological competencies are required to ensure that stock is correctly registered, stored and successfully located electronically for quick distribution. Naturally, the knowledge and skill levels of the workers need to be regularly retrained because Information Technology (IT) systems play a major role to support the business to be competitive. Training courses are often developed and planned, but they fail to meet their intended objectives due to the unavailability of staff for training. Very few modern companies can afford it to have their workforce attend training sessions where the workers have to leave the functional environment for long periods. Some corporate companies plan to introduce e-learning to prepare and train their employees. From the following quotes the importance of computer literacy becomes evident:

Clearly, knowing how to effectively deploy technology in the workplace has become a mission-critical business skill (Derryberry *et al.*, 1998, p. 2).

ICT¹ infrastructures have given birth to a context that is increasingly directed at empowering employees at all levels in the organisation (Weeks & Lessing, 2002 p. 66).

Unfortunately the biggest mistake companies make when moving to e-learning is failing to prepare their employees to become self-directed learners (Sheila Paxton, Business Wire, 2001).

These observations directed my research. Information technology drives businesses and empowers those who manage them, and is believed to possess an ability to empower those who participate. But do they?

e-Learning is highly dependent on the learners' ability to use computers, the Internet, multimedia to construct meaning from different sources of knowledge, learners' attitudes towards learning, and motivation to learn on one's own.

1.2 Research problem

The purpose of my research is to explore the e-readiness of warehouse workers in a SCM environment. Instructional designers and corporate training facilitators are not clear whether e-learning is a viable training strategy for these learners, especially for learners in developing countries with little experience in technology. There is a definite need, because classroom training is a costly

¹ Information and Communications Technology.

exercise for most companies, therefore they are increasingly interested in e-learning as a possible training solution. The cost-saving factor appeals to companies, but is it a feasible decision to impose a learning strategy on a group of people who may not be ready for it yet? Instructional designers and training facilitators are not always clear whether this is a viable option. This study aims to explore the e-readiness of a specific warehouse community in South Africa.

1.3 Effects of Globalisation

1.3.1 Globalisation

The SCM environment moves across national boundaries and traditional business zones to survive against strong competition and is compelled to use leading-edge technology to survive in the global commercial jungle (Bantock, 2004). Business executives respond to the needs of their clients and customers through the efficient and effective use of technology, and become part of the global market:

The need to work smarter and faster, access and use information when and where it is needed all point to deploying information technology to improving learning and performance. Supporting the training and professional development needs of an organisation's workforce via technology has become an important strategy for increasing and maintaining a company's competitive advantage (Derryberry *et al.*, 1998 p. 7)

Global firms use technology to outperform and overtake their competitors. Technology is used to gain an advantage with pricing, products, partnerships and the management of basic business functions (Poirier, 1999; Turban, McLean, & Wetherbe, 2001). Software planning enabled the SCM environments to pursue modern best practises, making it clear that technology has become the driving force for these firms (Helming & Zonnenberg, 2003). A successful SCM company is regarded as accurate and trustworthy in its deliveries and performs reliably for both customers and clients. Information technology can be seen as the 'adhesive' to get all role players to pursue a common goal (Hunter, 2003).

This poses a simultaneous opportunity and threat, in that businesses may prosper, but related communities or groups that do not share the same level of expertise may be disadvantaged in some way or another. They feel that they cannot compete on an equal footing (Hammond, 2001; Weeks & Lessing, 2002). Van Audenhove (2003) adds that the implementation of technology is too easily regarded as a magical gateway to prosperity while there are too many factors that need to be addressed. The "fundamental dualism" describes a competitive and technologically advanced Western world, while the developing world lacks the infrastructure and needs to import technology and the accompanying skills (Van Audenhove, 2003 p. 65). This paradox of rich technological environments versus limited technological environments may be evident in SCM companies in that the highly technical organisation relies on members of the previously disadvantaged communities in South Africa. The technology may be a challenge, and an opportunity to develop, but at the same time it can also be threatening to the warehouse workers, due to the lack of previous exposure.

This lack of exposure and awareness then gives rise to the effects of the digital divide, and definitely affects the learning by warehouse workers.

1.3.2 Digital divide

The digital divide refers basically to individuals, communities, cultures, nations who have access to IT and those who don't. Those who do not, refers mostly to developing countries, and especially to disadvantaged communities with insufficient electronic infrastructures (Bridges.org, 2001; Digital Opportunity Task Force, 2001). Many refer to an existing gap:

...the digital divide refers to the gap between individuals, households, businesses and geographical areas at different socio-economic levels with regard both to their opportunities to access information and communication technologies and their use of the Internet for a variety of activities (Weeks & Lessing, 2002 p. 67).

The gap grows and expands due to the extensive use by the higher socio-economic communities. Kubichek (2001) highlighted the disparity in the growth rate of computer ownership and use thereof, to expose those communities who are not in the position to obtain the technology. Access to, and the competency to use technology seems a general reason for the existence of the digital gap (Bridges.org, 2001; Digital Opportunity Task Force, 2001; Kubichek, 2001; Weeks & Lessing, 2002). South African SCM companies participate in the global market, and are vulnerable to the effects of the digital divide.

1.3.3 Warehouse workers exposed

The SCM industry is fast becoming dependent on information systems (IS) and some forms of automation that require a specific IT literacy and a level of IT competency from the warehouse workers (Logistics News, 2003, p. 137). The progress and growing dependency on IT in SCM industries is illustrated by D. Janse van Rensburg, Director IT and Logistics, during a breakfast seminar for the Professional Society of Supply Chain Managers (SAPICS) (Jansen van Rensburg, 2003). He referred to the transformation the SCM business experienced during the last decade, and the implications that it had for business and its resources. Figure 1.1 (Jansen van Rensburg, 2003) illustrates a linear model, which seems to be very simple compared with the complex model illustrated in Figure 1.2.

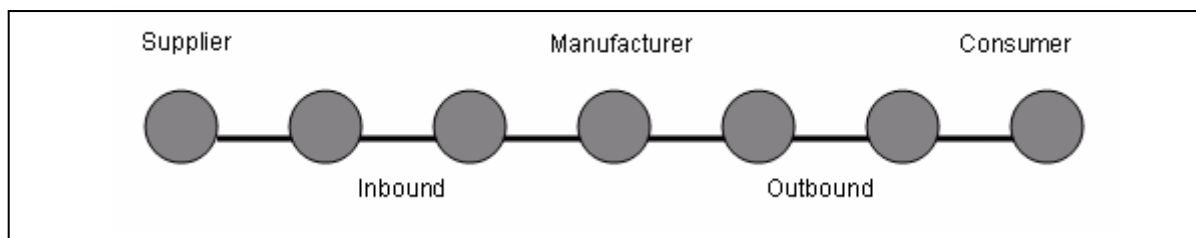


Figure 1.1 The old supply chain model (Jansen van Rensburg, 2003)

The new SCM model is visibly different and more complex (Figure 1.2). Most activities are technology and business procedures driven to supply solutions to businesses.

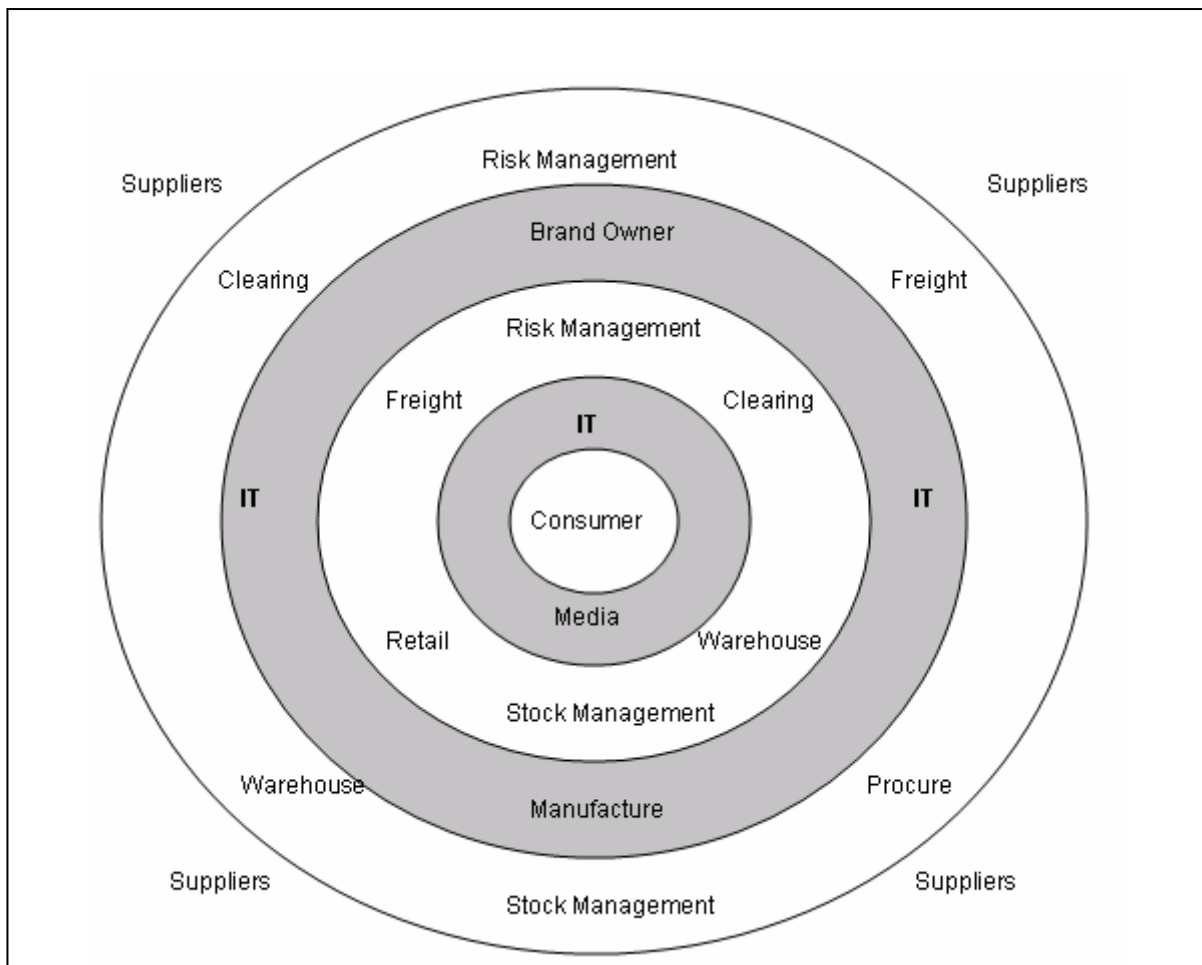


Figure 1.2 The new supply chain model (Jansen van Rensburg, 2003)

Specific skills, inputs and responses are required to ensure that stock is correctly registered, stored and successfully located electronically for quick distribution. In my capacity as training consultant at International Healthcare Distributors (IHD), a pharmaceutical distribution company in Johannesburg South Africa, I have been involved in developing several training courses on some of the functional systems. Training courses are presented with mixed success. Employees are not always available for training, or are only allowed to leave their functional environments for a short while. Instructor-led training requires the staff to leave their functional areas to receive training (Miltiadou & Savenye, 2003). This absence from the work area has an immediate negative effect on the speed of procedures and can affect profits. At IHD, if the workers are consequently not at their posts, deliveries of pharmaceutical goods may be late. Lives may be at risk if medication is not received on time. Therefore, training is compromised to the eventual detriment of the development of the workers. Calls for training, and more specifically electronic training, are heard more and more often (Derryberry *et al.*, 1998; Jordan, 2000). Technology with its electronic learning tools can offer individualized learning and is regarded as the great enabler and holds the key to closing the digital divide

(Czerniewicz & Brown, 2005; Derryberry *et al.*, 1998; Gawe & De Kock, 2002; Herselman & Britton, 2002; Ifinedo, 2005; Jordan, 2000; Krebs, 2000; Van Audenhove, 2003). Terry Bantock (2004) from Imperial Logistics adds that companies are set to “gain a competitive advantage” by using the latest technology and superior skills (p. 5).

Howard Stafford from IBM SA states that e-learning is the right way to train for the future (Computing SA, 2002), while Michiel Barnard from CTI openly acknowledges that the race to set up e-learning centres is on (Business IT Africa, 2002). Companies increasingly invest in e-learning (Haney, 2003). Against this background comes a concern from Sheila Paxton that attention should be given to the readiness of the learners before or when computer assisted learning is planned (Business Wire, 2001).

1.4 Rationale

IHD and many other SCM companies around the world are on the verge of implementing e-learning as a continuous, just-in-time, needs-driven training solution.

1.4.1 e-Learning

e-Learning is defined in many ways. Calls are heard for one or other form of computer-based training – “continuous training” (Llorens, Salanova, & Grau, 2002), “e-learning” (Kay, 2002), “interactive learning systems (ILS)” (Baldwin & Sabry, 2003), “web-based training” (Powell, 2000), “information and communication technologies (ICT)” (Van Audenhove, 2003) amongst several other descriptions such as online training, computer-based training, etc. Some of these processes differ slightly, but all can basically be described as a training strategy where technology is actively involved.

e-Learning refers to the activity where a learner uses the Internet to access and interact with learning content and the facilitator, and to collaborate with co-learners in the quest to achieve a clearly defined learning objective. It includes getting support online, and constructing meaningful concepts which result in personal growth and development (Alessi & Trollip, 2001; Anderson & Elloumi, 2004).

e-Learning is widely promoted to be the solution where learners can not leave their work stations for classroom training. Advantages such as learner-centred approach, asynchronous learning, own tempo, just-in-time and cost effectiveness seem to be an attractive option for the South African supply chain industry (Powell, 2000). The opportunity to learn by means of technology is surely an exciting prospect, especially to the warehouse workers who seldom get a chance to do more work on computers. Usually, when new applications are introduced to the workplace, a classroom training course is organized to prepare the users for the new application. The value of learning with technology is evident in the way the Association of African Universities describes e-learning:

A shorthand for the computers, software, networks, satellite links and related systems that allow people to access, analyse, create, exchange and use data, information, and knowledge in ways that, until

recently, were almost unimaginable. It refers to the infrastructure that brings together people, in different places and time zones, with multimedia tools for data, information, and knowledge management in order to expand the range of human capabilities (Herselman & Britton, 2002 p. 270).

Alessi and Trollip (2001) and Anderson and Elloumi (2004) recognise the premium e-learning places of the learner. The learner will need knowledge and skills to use the Internet, collaborate with co-learners and interact with the facilitator. It includes getting support online and constructing meaningful concepts to result in personal growth and development (Alessi & Trollip, 2001; Anderson & Elloumi, 2004). Learners need to be proficient in the use of technology, because they will have to learn on an individual basis, motivate and monitor themselves, and decide for themselves what the next steps will be in their assigned career paths. "Electronic learning provides a means of responding to an individual's self-determined need for improvement wherever there is access to an Internet or a network connection" (Derryberry *et al.*, 1998 p. 11).

Rarely, if ever, does one come across a corporate strategy where the readiness or preparedness of a potential user group is investigated prior to introducing new applications. The learner should be ready to adapt to this self-driven way of teaching and learning. Powell insists that several factors should be thoroughly investigated before web-based training (WBT) is implemented. Among these factors is the question: Who is being taught? He continues by discussing the importance of the business culture and the characteristics of the learners within the organisation. Aspects to consider are computer literacy, reading abilities and ability to learn (Powell, 2000). It would be unfair not to consider the readiness of the target group.

1.4.2 e-Readiness

e-Readiness refers to the necessary infrastructure, access to this infrastructure, policies to support the use thereof to participate in the international global network (African Education Knowledge Warehouse, 2003; Mutula & van Brakel, 2005). The Southern African Developing Countries Task Force regarded e-readiness in terms of:

e-Readiness and the level of competence in areas such as e-governance, e-services, e-business, ICT awareness, infrastructure, and policy and regulatory frameworks. This involved primary in-country research of all the SADC Member States on the status of e-readiness (African Education Knowledge Warehouse, 2003, p. 2).

Are warehouse workers in a position where e-learning as a learning strategy can be imposed onto them with confidence? Do they have the infrastructure, access and policies to support them to develop as self-driven learners?

1.5 Scope of the study

1.5.1 Context

International Healthcare Distributors (IHD) is a pharmaceutical distribution company situated in

Johannesburg, South Africa. They offer logistics service to world renowned pharmaceutical companies like Bayer, Boehringer Ingelheim, Sanofi Aventis, Bristol Myers Squibb, Eli Lilly, Roche, Schering, Schering Plough, Pharmaco, Pfizer and Wyeth. IHD operates nationally from five distribution centres within South Africa (Johannesburg, Cape Town, Durban, Port Elizabeth and Bloemfontein) and employs approximately five hundred people around the country (IHD Website, 2006).

IHD is a company that relies heavily on technology to ensure the accuracy of the receiving, storing and especially the delivery of stock to pharmacies, hospitals and healthcare centres across Southern Africa. IHD takes pride in its offering:

[IHD]...strives to be the front runner in employing advances to meet all challenges. Examples of such advances include batch tracking of products from manufacturer to end dispenser, fully air conditioned warehousing, stringent cold chain maintenance and the development of Futurewave, an Internet based ordering system". It also refers to its proficiency and highly technological abilities: "...development and launch of Futurewave heralded the first non-proprietary, electronic ordering system for pharmaceuticals via the Internet. IHD aims to combine information technology abilities with logistics strengths for effective e-commerce (IHD Website, 2006).

IHD is a global company that needs to excel in its offering to attract clients and customers, and aggressively pursues the latest technological methods and solutions. A large number of its workforce includes warehouse workers who are responsible for the receiving, registering and storing of stock (Figure 1.3). When orders are placed, they use technological systems to locate, pick and pack the stock for delivery.

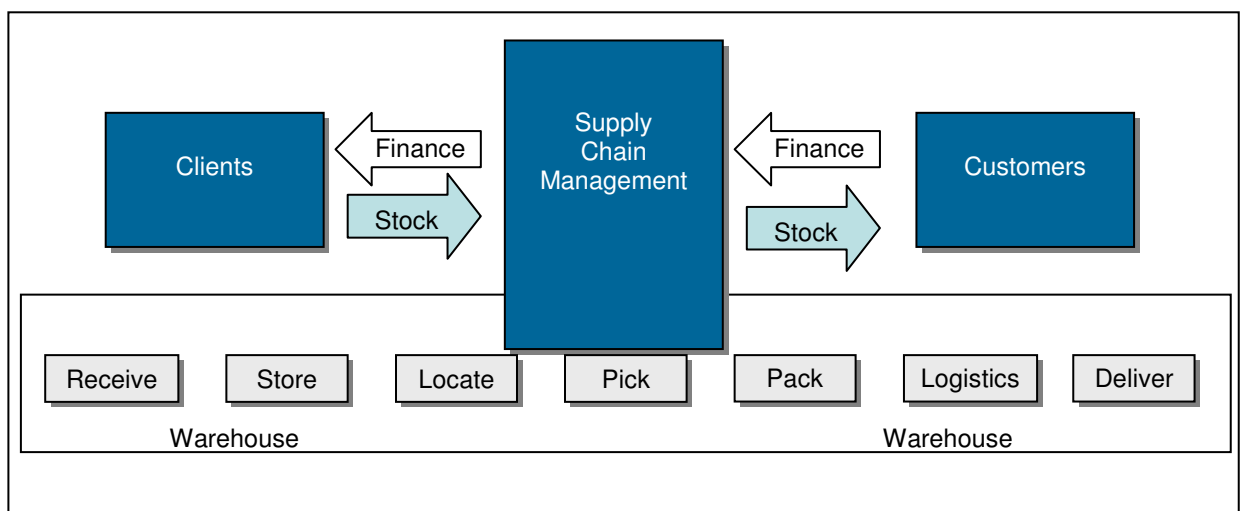


Figure 1.3 Basic Components of Supply Chain Management (Diagram by the Author)

Progress in technology and integration in the workplace holds specific consequences for the workforce. The social structure of the workforce, together with the technological innovations, bring about change in organisations (Llorens *et al.*, 2002).

Poirier (2003) identifies an interesting paradox;

Proponents indicate strong endorsement and support for things technical and collaborative. At the same time, the preparedness for the ingrained business cultures to accept and assimilate the necessary transformation process is often lacking.

He believes that technology can be successfully utilised, but warns that the lack of computer skills may affect the success of the venture (Poirier, 2003). The way corporate companies conduct learning becomes more and more important because it needs to support business strategies (Jordan, 2000).

Research by the ASTD Global Network SA found that a substantial portion namely thirty seven percent of South African companies presently use some form of technology-assisted training to train their employees. Serious concerns are raised regarding the fact that less than fifteen percent of these companies spend time on training employees on how to acquire the necessary skills to become self-directed learners. This is a "...skill of utmost importance if companies want to see a decent return on investment for the money spent on e-Learning initiatives" (Rourke, 2003, p. 40).

Stafford of IBM (SA) comments that companies can have the best and most advanced technology available, but if no investment is made in its people, the investment will prove to be costly (Computing SA, 2002).

1.6 Research questions

This study aims to investigate the readiness of warehouse workers, with the assumption that e-learning is about to be introduced in their environment as a learning strategy. Available literature has given me excellent guidelines on the perceptions, ways and methods e-readiness can be measured. I have used a selected group of documents to assist me in determining the main categories of e-readiness.

Research Question

How ready are warehouse workers for e-learning?

Human life is complex, and various influences and variables exist in the environment upon which we react, interact to develop an ability, skill, personality and knowledge about ourselves and our environment. When e-learning is planned, we will react according to these influences and variables. This research aims to explore the e-readiness of a warehouse community employed at a leading pharmaceutical company in South Africa. It is a company that is driven by modern technologies to remain at the leading edge of supply chain management. It is expected that the surrounding technology and fast pace of technology influences the warehouse workers either directly or indirectly.

Figure 1.4 is an illustration of the formulation of my research question, and how I went about to

structure my information-collection strategy. It shows the two main sources that assisted me in formulating the sub-questions to determine the e-readiness of warehouse workers. From the literature and subject-matter experts it was possible for me to define the main categories of e-readiness.

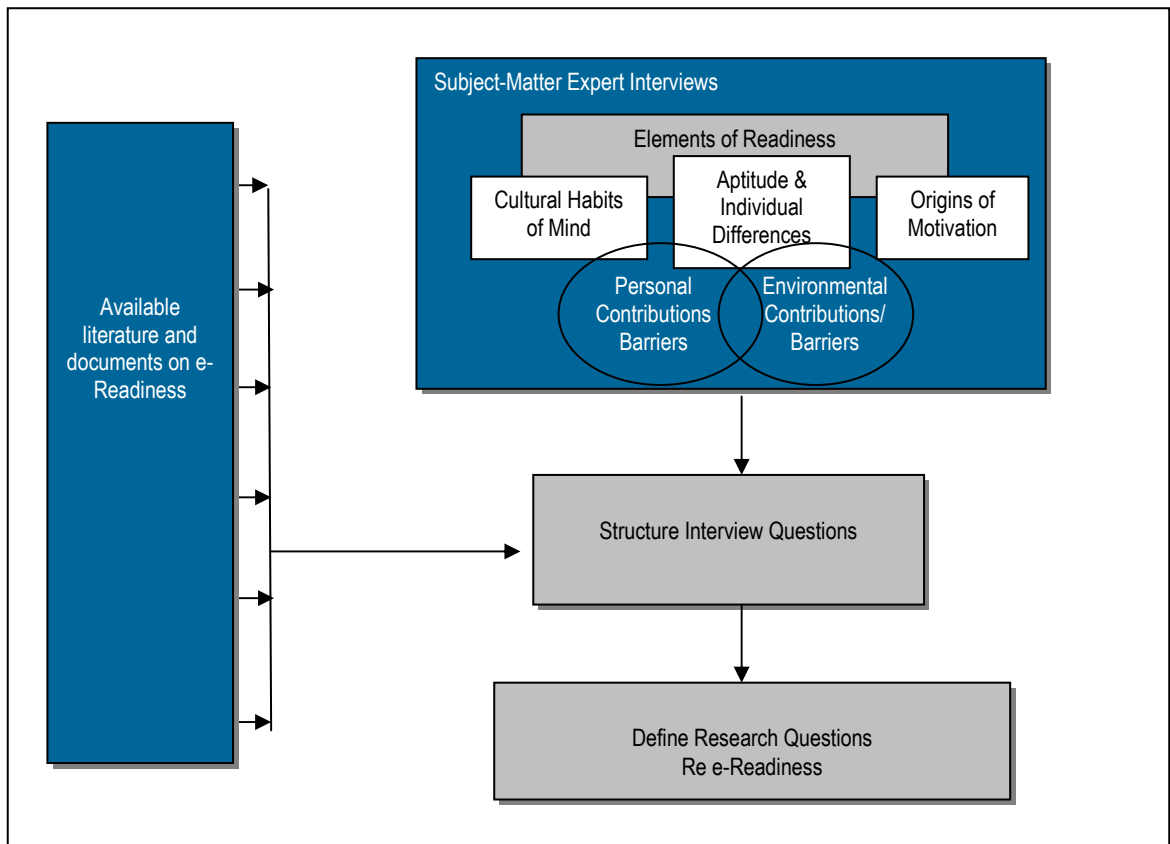


Figure 1.4 Formulating the sub-questions

1.7 Theoretical framework

1.7.1 Positioning the research

Many academics refer to Burrell and Morgan's (1979) four paradigms when explaining or defining social research (Batterham, 2002 p. 160; Cohen, Manion, & Morrison, 2002; Cronje, 2000; Lehane *et al.*, 2004; Mills, 2001; Nurminen, 1997; Ritchie & Lewis, 2003). Burrell and Morgan's four paradigms for social research are illustrated in Figure 1.5.

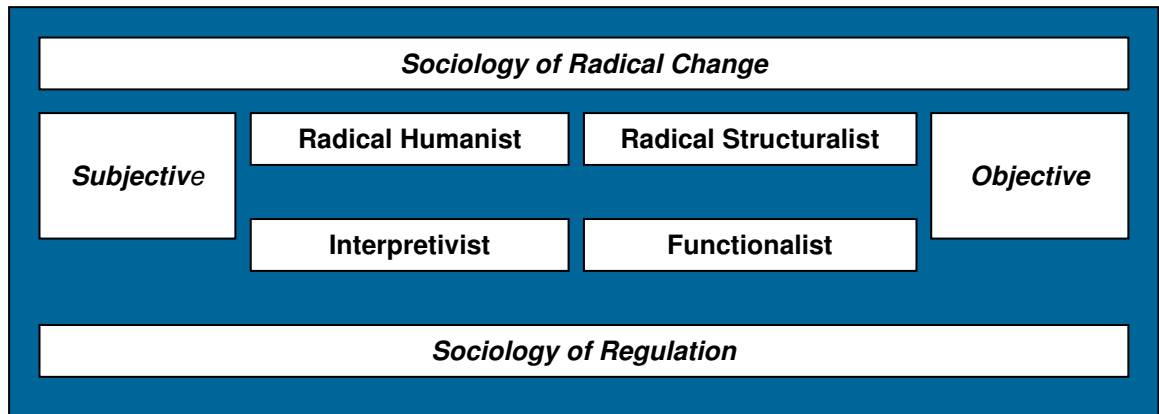


Figure 1.5 Four paradigms of social research (Burrell & Morgan, 1979 p.22).

When the social phenomenon, e-readiness, is investigated, one needs to orientate it within the four paradigms of social research (Mills, 2001). Considering the target population and the state of readiness to be investigated, I am aware of the fact that I can place it in any one of the four quadrants of Burrell and Morgan’s model of Social Theory. Morgan insists that although all paradigms may be supported by an individual, it is when a report is written that you are committed to take a stance from a specified position “because the whole medium requires that you take a position and define and articulate exactly where you are” (Mills, 2001). I will briefly discuss how my research relates to functionalism, radical humanism, and radical structuralism, and conclude with interpretivism, my preferred philosophy for this research.

1.7.2 Functionalism

Functionalism refers to the social paradigm where a rational explanation is given to reality (Boshier, 2000). According to this author, a positivist, objective epistemology is concerned with social order. Functionalism is described as the theory when the design of an object is governed by its use rather than a pleasant appearance. Shulman (1986) describes functionalism as a paradigm that reasons that social structures exist in organisations, institutions and technologies, and are independent of people. From this objectivist point, human behaviour is influenced.

Ample reasons exist to conduct the research from a functionalist perspective. Morgan (in Mills) declares that the really important distinctions between the paradigms are the ontological issues, where reality is described to be either subjectively or objectively constructed (Mills, 2001).

1.7.3 Radical humanism

e-Readiness for the warehouse worker surely has an emancipatory flavour, because the South African warehouse worker falls largely in the previously disadvantaged community (ICT Charter, 2004). Supporters of the radical humanist paradigm will probably support the notion that with regard to e-readiness, social reality is definitely external to individuals, and may contribute to change (Cohen *et al.*, 2002). Considering the South African political history, and the reality of the digital divide, they may have a point. Morgan explains that in this paradigm, individuals by themselves, and in conjunction

with others in their social environment, consciously try to reorganise their experiences by challenging domination (Mills, 2001).

Boshier (2000) describes it aptly by stating that radical humanists want to free people from social constraints. One is tempted to categorise this research from a radical humanist point of view, when he says that “they seek transformation, emancipation...” (Boshier, 2000). The workforce in South Africa has a large number of workers that are under-educated, and although actions and structures are put in place to develop and endow this workforce, it may not be enough (ICT Charter, 2004). Radical humanism is active where people want to rectify the wrongs and want to “revitalise” their cultures, e.g Maori’s in New Zealand, as stated by Paulston in Boshier (2000 p. 1) by means of education. This may seem to be a valid motivation for this research.

As stated above, this research investigates a status, a condition. e-Readiness refers to the status of the workers in relation to electronic education strategies. If a radical humanist perspective is followed, the focus for this research may shift to the groups, their relationships with society, the reasons for the condition they find themselves in, and ways to bridge the gap. My research is mainly aimed at understanding the condition in which they find themselves, and how they perceive the expectations and work demands placed upon them.

1.7.4 Radical structuralism

Bent on a philosophy of social change, radical structuralists are committed to do away with existing structures (Boshier, 2000; Mills, 2001). Structuralists differ from radical humanists in that they criticise the structures, communities and social world, thereby implying a more objective, impersonal viewpoint (Boshier, 2000). Burrell and Morgan place this paradigm as objective, and intent on social change, as shown in Figure 1.5 (Batterham, 2002; Cohen *et al.*, 2002; Cronje, 2000; Lehaney *et al.*, 2004; Mills, 2001; Nurminen, 1997; Ritchie & Lewis, 2003).

e-Readiness implies the individual’s relation to technology. Shulman sees technology as a highly structured social entity, as it is developed and then changed according to user needs and specifications (Shulman, 1986). These structures are not fixed but go through a virtually endless development cycle to address the needs identified by users. It assumes that “technology and user behaviour co-evolve as a structural process during the course of human-computer interactions” (Shulman, 1986).

Shulman comments that the structuration theory probably describes the information systems processes best, because its strength lies in the ability to study changes.

IS researchers often are interested in change, whether engineering change, as in introducing new forms or functions within technology, or observing change, as in monitoring individual or organisational behaviour following introductions of a change in technology (Shulman, 1986).

Again this study on e-readiness can be placed squarely within this paradigm in that the social structures of the target group can be investigated in the way they contribute to the state of readiness displayed by warehouse workers. e-Readiness, the result of the use of technology, confirms this assumption. But once again, from the epistemological point of view, it will imply that the research will have to be more objective and positivist, while the aim of this research is to identify and understand the condition of e-readiness as subjectively experienced by the South African warehouse worker.

1.7.5 Interpretivism

The interpretive view of social research recognises human differences and how people perceive knowledge in their own unique ways. Knowledge is constructed by the individual through social interaction and experience (Lehaney *et al.*, 2004; Weber, 2004). Figure 1.5 illustrates this paradigm as subjective, and seen from a perspective of social regulation (Batterham, 2002; Cohen *et al.*, 2002; Cronje, 2000; Lehaney *et al.*, 2004; Mills, 2001; Ritchie & Lewis, 2003). With this I suggest that I need to understand the situation as it is, from a subjective point of view, and with the intention to experience the relationship the warehouse workers have with their technological environment.

Traditional researchers will investigate social sciences by trying to discover universal and natural laws that determine human knowledge and behaviour, while interpretivists share the same concerns, but seek the existence of knowledge in the individuals and their relation with the environment and with one another (Cohen *et al.*, 2002). My research is not intent on bringing on any changes, but mainly to understand and see the phenomenon from their point of view.

Interpretive research studies the individual subjectively and how he/she interacts with the world around them, how they cope, manage, and give meaning to their environment (Cohen *et al.*, 2002; Merriam, 1998; Vockell, 2005). They agree that the social world can only be understood from the perspective of the individuals who are involved in the phenomenon to be investigated. This concern for the individual (Cohen *et al.*, 2002) is an accurate description of the aim of this research. Where the normative paradigm is intent on devising general theories of human behaviour, this research will rather try to understand, and position it-self to address e-learning as a modern learning strategy with more clarity. Table 1.1 summarizes and compares the ontological epistemological preferences of the four research approaches (Batterham, 2002; Cohen *et al.*, 2002; Cronje, 2000; Lehaney *et al.*, 2004; Mills, 2001; Nurminen, 1997; Ritchie & Lewis, 2003).

Table 1.1 Paradigms of social research

Paradigm	Ontological epistemological preference	Description
Functionalist	Objective – positivist accepts regulation	Supports traditional empirical research
Interpretive	Subjective – anti-positivist accepts regulation	Social world created by the individuals themselves.

Paradigm	Ontological epistemological preference	Description
Radical Humanist	Subjective – positivist moves to change	Social world created by individuals, but does not accept the status quo, intent on change.
Radical Structuralist	Objective – anti-positivist moves to change	Supports the functionalist view, but uses this research to change social structures and organisations.

e-Readiness, as a condition in relation to technology is experienced individually, from different backgrounds, educational levels, study habits, learning styles, computer literacy, needs and aspirations. Research to identify the constraints, abilities and underlying aspirations, can assist in the strategies and methods to speed up the use of technology at this level.

1.8 Perspective orientation

I will use Burrell and Morgan's subjective-objective dimension to explain my research perspective as cited by (Cohen *et al.*, 2002) in Research Methods in Education. The subjective-objective dimension is shown in Table 1.2.

Table 1.2 Subjective–objective dimension

Subjectivist approach		Ontological		Objectivist Approach
Nominalism	←		→	Realism
Anti-Positivism	←	Epistemological	→	Postivism
Voluntarism	←	Human nature	→	Determinism
Idiographic	←	Methodological	→	Nomothetic

(Burrell & Morgan 1979)

When the ontological assumption regarding the position of the warehouse worker relating to e-learning is evaluated, the typical question arises: Is this social phenomenon due to the consciousness, or lack, of the social reality? Taking guidance from (Cohen *et al.*, 2002), ontology refers to either a nominalist or realist position regarding truth and knowledge. e-Readiness, as a relative condition, is very dependent on several intrinsic and extrinsic variables, and therefore this study chooses to regard the concept of e-readiness as nominalist, as this concept will only become meaningful when interpreted by an individual (Cohen *et al.*, 2002).

The epistemological assumption refers to the base of knowledge, whether it is “hard, real and tangible versus the anti-positivist view that it is softer or more spiritual and needs to be personally experienced” (Cohen *et al.*, 2002 p. 6).

Regarding the investigation into the readiness levels of warehouse workers, I assume an anti-positivist approach. There are several aspects of e-readiness that can only be understood if the investigation is conducted from an empathic, personal and involved point of view. I need to explore and understand

their confidence, attitudes and perceptions regarding technology. The aim of this research is to work with individuals and find out how they regard technology, whilst making sure that a clear understanding can be formed as to how they perceive the technology as a possible learning tool and platform. This makes this research subjective and interpretive; i.e. aiming to find several possible answers to a single question.

(Cohen *et al.*, 2002) describe subjective studies to be anti-positivist: Anti-positivism accepts people to be creative and deliberate, to create meaning to their environments by building and maintaining relationships with it. These relationships allow them to construct a meaningful social world, so that they can cope with the dynamics of that world. Every time an individual is confronted with a situation, he or she gives meaning to that event by reacting in a unique way, therefore taking care of the social relations in unique ways. This uniqueness is what the interpretivist is interested in, to try to understand a phenomenon from the different interpretations given to a situation (Cohen *et al.*, 2002).

Ritchie and Lewis state, "A social researcher has to explore and understand the social world through the participants' and their own perspectives" (Ritchie & Lewis, 2003 p. 7). True understanding is believed to be possible when the investigator shares the frame of reference (Cohen *et al.*, 2002). Merriam (1998) defines research, where an understanding of the meaning people construct is investigated, as qualitative research.

When human nature as an assumption is evaluated, Burrell and Morgan (1979) distinguish between voluntarism and determinism. Determinism refers to the objectivist point of view that external environment issues determine human behaviour, while voluntarism imply that the human being is the initiator of his own actions (Cohen *et al.*, 2002). I concur with the latter that individuals are immersed in their social environments and build conscious relationships with their environments. In the context of this study, I believe that the e-readiness level of the warehouse workers is determined by each and every person's ability to deal and cope with technology. This is in sync with Cohen *et al.*'s view that supporters of the subjectivist approach will view the world as "softer, and humanly created...select from a comparable range of emerging techniques... personal constructs, for example" (Cohen *et al.*, 2002 p. 6-7).

The corresponding methodology for subjectivists as described by Cohen *et al.* (2002) would then be idiographic in order to understand individual behaviour. I have adopted this interpretive method to interpret the way the warehouse worker experiences his/her world.

In interpretive research, the target group is investigated in naturally occurring situations, and not in a controlled environment (Vrasidas, 2001). The actions, thoughts, attitudes and relevant social relations of the incumbents will have to be investigated. Merriam describes this phenomenon as an interpretive or qualitative research methodology interested in discovering factors by means of interviews, observations and reviewing documents (Merriam, 1998).

Merriam defines qualitative research as “an umbrella concept covering several forms of inquiry that help us understand and explain the meaning of social phenomena with as little disruption of the natural settings as possible” (Merriam, 1998 p.5). She then states that all types of qualitative research are conducted from a mindset that knowledge is constructed by individuals as they experience, or live, their environments. “Qualitative researchers believe that reality is a social construction, individuals and groups ascribe meanings to specific entities, such as events, persons, processes, or objects” (McMillan & Schumacher, 2001 p. 395). This “meaning” includes their feelings, beliefs, ideas, thoughts and actions.

Erickson (1986) regards the term "interpretative" as inclusive of a wide spectrum of approaches as he deems it to be even more inclusive than ethnography or case studies. Erickson's definition accurately describes the purpose of this research when he argues that “central research interest in human meaning in social life and in its elucidation and exposition by the researcher” (Erickson, 1986 p. 119). Weber (2004) states that the truth – or some kind of notion - already existed prior to the investigation, and by means of interviews, observations, interaction and understanding, the actors review this assumption to report the truth as it has been found.

e-Readiness describes a condition, a result of specific procedures and systems that are or are not in place. Where variables such as technology (infrastructure), skills, connectivity, and opportunities available can be measured, it is the subjective aspects that will really determine the level of readiness experienced by the target group. These include physical and emotional readiness, habits, knowledge, confidence, cultural and personal perceptions regarding technological issues. Reflection on what is, and what can be, is investigated. The objective "real" and “subjective understanding” are interlaced (Lehane *et al.*, 2004) and each provides the conditions for the other. Therefore, e-readiness has to be constituted through human experience and understanding, and qualifies to be subjected to qualitative research.

1.9 Research methodology

1.9.1 Qualitative research strategy

e-Readiness refers to the preparedness of warehouse workers to get involved in e-learning. I will use a qualitative case study to construct an in-depth description of their responses and attitudes to e-learning. According to McMillan and Schumacher case study designs are suitable for exploratory research “which examine a topic in which there has been little prior research” (2001 p. 399). When a learning strategy with computers is planned, it is imperative that instructional designers conduct a thorough needs analysis (Alessi & Trollip, 2001; Reeves, 1999). This analysis includes the understanding and determination of the target group's needs, skills levels and competencies to be subjected to computer training. The exploration of the readiness of warehouse workers is therefore

similar to a target-group analysis when computer-assisted training is planned. The skills level of the target-group forms the main purpose of this research. Reeves (1999) has urged instructional designers to conduct this analysis from three basic points of departure when planning training on the world wide web. They are “Aptitude and Individual Differences, Cultural Habits of Mind, and Origin of Motivation” (Reeves, 1999).

This research is exploratory, and lends itself to a flexible design, with the intention to adapt the strategy as information emerges. Merriam (1998) cites Glaser and Strauss (1967) to confirm the collecting of data by deciding on the next person, place and what to collect, as the information becomes available. As stated by Ian Hart: “Remaining open to the possibility of unpredicted outcomes is a central tenet of qualitative research” (Hart, 1997 p. 3). I will follow a semi-structured approach to enable me to construct my interpretation of the research problem (Mouton, 2002).

My selection of the qualitative research model is based on the belief that people are unique and always interpret and construct their knowledge of social reality from their own points of view. The warehouse workers give meaning to the social phenomenon individually and collectively to form their own attitudes, “beliefs, thoughts and perceptions” (McMillan & Schumacher, 2001 p. 395). I will employ a case-study design to gain an in-depth understanding of the situation and meaning of the e-readiness of the warehouse workers (Merriam, 1998).

1.9.2 Case study

The case study is selected as a strategy because I have worked with a specific defined community which can be described as a single unit with shared values, attitudes and principles. This methodology was selected to enable me to explore and present an in-depth understanding of the e-readiness of the target audience (Merriam, 1998). A case study concerns itself with a rich, chronological description of events, and seeks to understand the perceptions of the actors during the events (Cohen *et al.*, 2002).

For my research, I have opted to do an interpretive investigation, because I needed to “see” the status or condition of the warehouse worker through his own eyes. I needed to understand the barriers the worker perceives as preventing him/her from working with technology, the anxiety he/she experiences when opening a file, and the joy and motivation resulting from a successful action on a computer. Phenomenologically approached studies opt to understand behaviour from the “insiders” point of view (Hart, 1997 p. 3). I chose to work from an interpretive perspective, to concentrate on understanding the warehouse workers. The study will be qualitative to enable me to present a richly described account of my understanding of the warehouse workers’ e-readiness. Elements of critical enquiry and phenomenological approach have also been used in this research, in that the phenomenon e-learning is under scrutiny all the time, and the subjective perceptions of the learners explored.

1.9.3 Unit of Analysis

The unit of analysis is the warehouse workers working for IHD in five DC's in Johannesburg, Cape Town, Durban, Port Elizabeth and Bloemfontein. They represent all races in South Africa, both genders and ages range from eighteen to approximately sixty years old. Most have high school educations. They are responsible to receive stock, register the arrival, prepare the stock for storing and move the stock to the assigned areas within the warehouse. They are also responsible for the picking, packing and despatching of the stock. These procedures are supported by computer systems.

1.9.4 Methods of Data Collection

Typical data-collection instruments for qualitative research are interviews, observations, document analysis (Hart, 1997; McMillan & Schumacher, 2001; Merriam, 1998; Radnor, 2001). I have used all three these instruments to collect data to explore the e-readiness of the warehouse workers. The levels of the interviews have been adapted and structured according to the technological knowledge and learning levels of the participants. I have collected the data in four phases:

- Preparation phase: Biographical data collection with questionnaires
- Phase 1: Define the e-readiness categories
- Phase 2: Interview, observe warehouse workers to probe, explore for elements of e-readiness identified in phase 2
- Phase 3: Interviews with business managers to determine environment readiness and support.

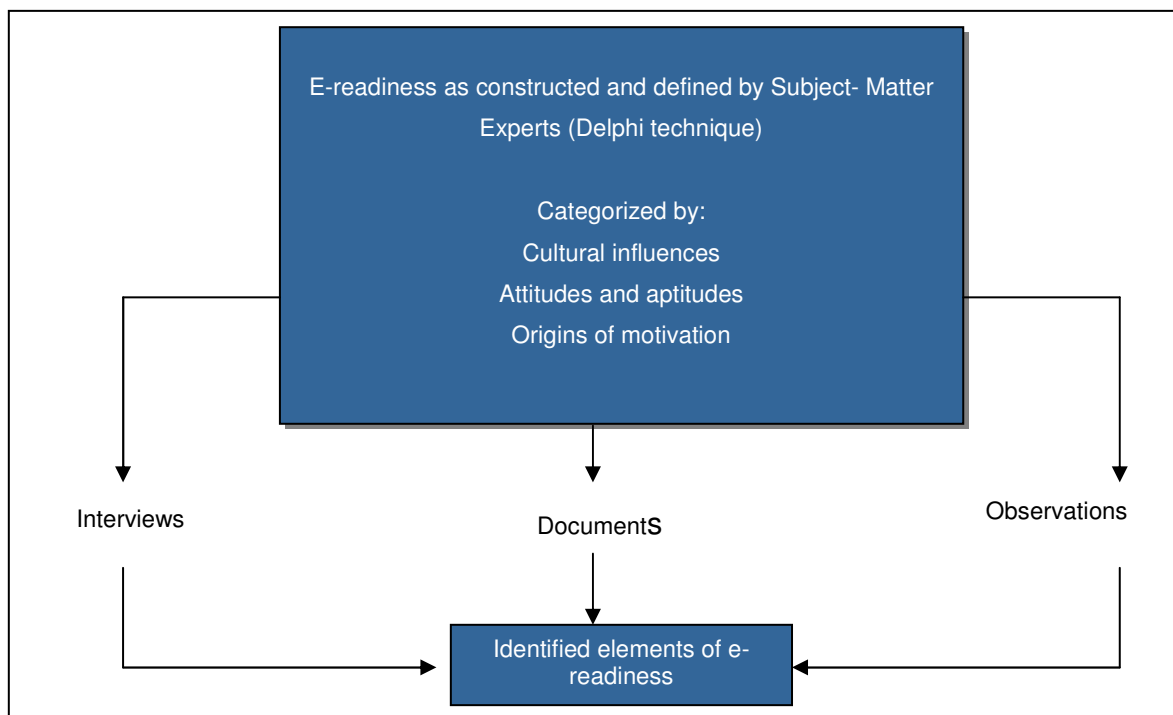


Figure 1.6 Data Collection Instruments

Preparation phase

The preparation of the research started with a questionnaire to warehouse workers from all five DCs in SA (Appendix 3.3). The purpose of the questionnaire was to establish the racial numbers, education levels, whether they work with technology and to confirm their status as warehouse workers. This phase preceded all other data collection procedures. Some of the questionnaires had been updated and redistributed to participants later during the data collection process to precede interviews with warehouse workers.

Phase one

This is the phase known as the subject-matter expert phase. I had to determine previous and existing concepts of e-readiness, to enable me to define the main categories of e-readiness to explore. I obtained guidance from the literature to explore and determine e-readiness, and consequently eight e-learning experts in South Africa were consulted to ensure that I keep the South African context and related aspects of e-learning in mind. These subject-matter experts (SME) are all leaders in their fields and have extensive experience in the field of corporate training. I interviewed them to determine the basic elements that I need to explore when working with the warehouse workers.

From the literature I determined that six basic categories of e-readiness may be used to determine the readiness of warehouse workers. These categories are:

- Technical experience
- Access and infrastructure
- Attitudes, habits and individual differences
- Business culture
- Origins of motivation, and
- Organisation influences

This “category list” has been generated by identifying readiness categories from existing literature, and comparing, analysing and synthesising them to form the above list. I used this list to categorise the codes I generated from the interviews with the SMEs. I integrated the codes I generated from the SME interviews with the category list. The SME codes confirmed that my categories were appropriate to explore e-readiness of the unit of research. I used a combination of the SME results and the category list to generate my sub-questions for this study.

Phase two

I interviewed fifteen people and observed ten warehouse workers during their activities in the warehouse. The interviews included supervisors and managers who are responsible for the activities in the warehouse. One of the participants was the human resources training manager, who is responsible for the development of staff at IHD. Interviews were held with participants from Johannesburg, Cape Town, Durban, Port Elizabeth and Bloemfontein. During this time a group of warehouse workers had been interviewed and observed to obtain their understanding and experience of e-learning. I used the information I obtained during the previous phases to guide my conversation

with the participants. The conversations were recorded on Atlas.ti™ a computer assisted qualitative data analysis system (CAQDAS). I gradually developed ideas and inspiration as I progressed with the data collection (Hart, 1997).

I used three different types of observations: adult basic education (ABET) observations, warehouse business activity observations, and business procedure tutorial observations. The three ABET observations differed slightly from one another. The first was to observe a group of warehouse workers where they were busy doing computer based training (CBT) of adult basic education learning. I observed their general behaviour, attitudes and skill with the technology. With the second group, I concentrated on the computer actions only to determine the skill levels, while the last ABET observation was to observe an individual only. The second group of observations were to watch and video record the actions of five warehouse employees where they were busy with their daily activities in the warehouse. In all cases were they busy with technology. I hoped to observe their competency and skill levels with the technology. The last observation was to observe their behaviour and success while working on a tutorial destined for e-learning in the warehouse. I designed a tutorial on Macromedia Captivate® to learn employees how to find information on the Enterprise Business Management System (EBMS). EBMS is an application on the IHD intranet, available to all employees where users can determine and learn the standard operating procedures (SOP) of the company. The rationale is if all the employees know where to find information, they will be able to learn the business procedures on their own. I observed two employees during the completion of this tutorial. These observations were the only ones where I interacted with the participants.

I transcribed the observations on Atlas.ti™ as with the interviews, to form one large hermeneutic unit or integrated dataset. The hermeneutic unit is the data file that contains all the primary data, the interview and observation transcripts, codes, memos and structures. I used the normal procedure by creating categories about the data, coded the segments, indexed references to group them into meaningful combinations, sorted the groups to locate patterns and interpreted the findings according to my research objectives (Hart, 1997).

Phase three

During this phase I concentrated on the interviews conducted with the supervisors and managers, the organisation contributions to determine the readiness levels of the warehouse workers. I referred to the same hermeneutic unit – warehouse worker interviews as generated during the previous phase. The difference during this phase was that I concentrated on the organisations' point of view to explore the readiness of the warehouse workers. The same conversations were used to yield a different type of information.

1.9.5 Assumptions

I assumed that:

Warehouse workers are ready to be subjected to e-learning:

Their experience with technology has given them a basic platform to be introduced to technology. They have already been introduced to technology and use it – although limited – in their everyday work environment. This means that technology is not a total new medium for them to work on.

Their attitudes, habits and individual differences enable them to use and perceive technology in their unique ways. e-Learning is dependent on the learner's intrinsic motivation and drive to learn. Learners have their own perceptions of technology and respond differently to this medium. Individual attitudes may be a key principle to ensure the success or failure of e-learning.

Warehouse workers' readiness levels are subject to the provision of the motivation, access to technology and infrastructure of the business: The access and infrastructure the warehouse workers have to technology, influences the viability of technological training. The organisation provides its employees with the infrastructure to communicate and receive information. This same network of information is regarded to be critical for the success of e-learning.

Business culture plays a role in the readiness level of the warehouse workers. Time allocated for learning, a clear objective to motivate and guide learners are critical to ensure the learners are motivated and informed. Opportunities and guidelines for growth within the business come from good guidance.

The drive to use technology for learning is determined by the origins of motivation. The momentum of the learning process comes from the motivation, whether it is extrinsic motivation in the form of promotion, salary increase or recognition, or intrinsic to provide personal sense of achievement and growth. Motivation may persuade the learner to become a successful self-driven learner.

1.10 Data analysis procedures

I have opted for content analysis as my main data analysis technique. "Content analysis is a research tool used to determine the presence of certain words or concepts within a texts or sets of text" (Busch *et al.*, 1997). Although historically a quantitative technique (Merriam, 1998), I have used it to identify categories and allowed the categories to "emerge" from the data throughout the study. For my interpretive study, I have searched and explored the transcribed texts for explicit and implicit information (Busch *et al.*, 1997). I have used the CAQDAS application Atlas.ti™ to organize my data in two single data sets. The first hermeneutic unit (HU), titled "subject matter expert interviews", is the data collected from subject matter experts to guide me in the identification of e-readiness. The second HU, titled "warehouse worker interviews", was the data collected from the warehouse workers and the managers involved with the workers. I used information from them to generate categories of codes, and eventually patterns to respond to my research questions.

Content analysis needs to be stable, accurate and reproducible to conform to reliability (Busch *et al.*, 1997). I have taken great care to ensure that the same, procedure has been used to generate codes, and that the procedures were stable throughout the coding process. Atlas.ti™ proved to be invaluable for this purpose. I was able to use a standard norm throughout my coding procedure to ensure stability and reproducibility. Validity refers to the way conclusions are drawn from the categories (Busch *et al.*, 1997). I have discussed all categories as they relate to the identified patterns, which in turn answers my research questions.

1.11 Limitations of the research

This research dealt with the e-readiness of the warehouse workers. To ensure validity, reliability and to keep focus, the status of some aspects need to be cleared. Only warehouse workers were included in this research project, and I did not include any other of the staff employed at IHD, even though they may come from the same community. The time frame for this research is 2003 to 2006. The findings and methods relate to the current time and circumstances only and do not make any predictions.

I often had the urge to write and suggest possible solutions during the time I explored and identified the e-readiness of the research unit. This research focuses only on the identification of the readiness of the warehouse workers as they experience it on this day and time. As an experienced instructional designer, I often had to suppress the urge to make suggestions to overcome an identified problem or learning difficulty during interviews and observations.

Although culture is prominent in the research, I focused on the cultures as found within the corporate environment, and how the own culture, integrated with the business culture may influence a worker. I do refer to learning styles, but I have not investigated or tested the different learning styles at all. I am merely referring to learning styles to indicate the approach learners take to technology as learning strategy.

1.12 Reliability and validity

“In qualitative research reliability includes fidelity to real life, context- and situation-specificity, authenticity, comprehensiveness, detail, honesty, depth of response and meaningfulness to the participants” (Cohen *et al.*, 2002). Reliability in interviews is achieved by minimising the bias of the interviewer as far as possible. The reliability of observations is also threatened if the observer is ignorant of all factors, such as cultural habits. Merriam discusses the following methods to address reliability in qualitative research: Crystallize the results using multiple methods of data collection and analysis; Audit trail: give a clear and specific explanation of how “data is collected, categories derived, and ... decisions were made” (Merriam, 1998 p. 207).

The results of this research were obtained by investigating several workers from five different DCs in South Africa. Peer participants assisted to confirm or reject findings. Crystallisation is obtained by conducting interviews with participants from all the DCs in South Africa, by conducting observations during the execution of three different activities, and to compare findings with one another. My own views and theoretical orientation has been defined clearly.

In my research, the construct "e-readiness" is carefully defined, so that a clear and exact understanding is formed before any interviews or observations are undertaken. This is one of the reasons I have decided to conduct interviews with the subject-matter experts first, to get a clear understanding of what an "e-ready" learner will present. It becomes clear that the position the researcher takes, the ability to ignore personal biases, and above all, the ability to understand the participants' views, attitudes, habits and actions within the context of the researched situation, relates directly to the validity of the research.

The concept readiness implies a condition, that is not always measurable in terms of numbers, but it includes a subjectivity that enlarges the risk. Figure 1.7 is a diagram of data-collection strategies and explains how the interviews, observations and documents will be used once the construct e-readiness has been defined and outlined by the subject-matter experts.

1.13 Ethical considerations

I have obtained the required approval from the IHD executive committee and warehouse management to obtain the participation of the warehouse workers for this research study (Appendix 1.1 - Permission to conduct research with IHD warehouse staff).

I specifically followed the unwritten rule by contacting the warehouse supervisors first whenever I needed to interview workers. I had a signed consent but I still believed that I had to show the necessary respect by including the managers and supervisors in the research process. They were informed of my research and had a positive attitude towards the project. Before each interview, I went to the supervisor and asked him/her if I may interview an available employee. It also meant that my units of analysis were selected for me according to the availability of staff. I had no say in selecting any respondent, as long as they were working in the warehouse.

Before each interview, I explained the purpose of my study and allowed the respondent to decide whether he/she would be available for the interview or not. I also gave them the permission to terminate the interview at any time if necessary. The interviews were all conducted in a place where the participants felt comfortable, in a meeting room adjacent to the warehouse they worked in. They regularly met in these meeting rooms with their supervisors.

1.14 Thesis structure

The basic structure of the thesis is

- Chapter 1: Orientation
- Chapter 2: Literature review
- Chapter 3: Research design and methodology
- Chapter 4: Identifying the concepts of e-readiness
- Chapter 5: Data analysis and initial findings
- Chapter 6: Synopsis of e-readiness findings
- Chapter 7: Conclusion

1.15 Motivation to effect this research

e-Learning is widely promoted to be the answer where time is limited for learners. The advantages, such as a learner-centred approach, asynchronous learning, own tempo, and cost effectiveness seems to be an attractive option for the South African supply-chain industry. A fully-fledged e-learning strategy might be optimistic, but if the readiness of the warehouse workers is investigated and confirmed, strategies to implement e-learning can be considered. This will then determine the procedures that need to be addressed to establish an e-learning strategy for warehouse workers.

I believe this study is worthwhile for the following reasons:

- South African warehouse workers are already exposed to technology
- warehouse workers can be empowered if PC literacy skills are acquired
- PC skills will imply that less limitations exist regarding information availability and capacity building
- instructional designers and training personnel might get a better understanding of how to approach the learners and how the learning content is to be transferred
- training departments in supply-chain management industries might benefit if light can be shed on how to transfer knowledge to warehouse workers without having to jeopardise production and profits
- supply-chain management policy makers might be able to decide on a practical training policy due to definite results, rather than general beliefs.

I have heard many resigned responses made in meetings where electronic training was discussed for specified communities in organisations. “It wouldn’t work – it just isn’t worth the effort” is not an indication of the training staff’s lack of determination, but more an understanding of the complexity of the problem.

Problems in Africa are severe and difficult to overcome but success stories are evident. We must support Africa’s development through active participation. All African countries are qualified to reach this goal. But to reach it we need to work together to turn the digital gap into a digital opportunity Dr Ahmed Nazif, the Egyptian Minister of Communication and Technology (Mutasa, 2004).

Hammond gives a stern warning:

If these dangerous trends continue - if development does not accelerate and if the benefits of economic progress and new technology do not reach those at the bottom of society – then rather than increased prosperity for all, another, grimmer vision of the future may prevail. It suggests an unstable future, one ridden with conflict and environmental problems, in which islands of prosperity are surrounded by oceans of poverty and frustration. In such a world, even prosperous regions will fear for their security, for when all else fails, the poor will learn to export their misery and anger (Hammond, 2001 p. 2).

I believe the value of this research lies in the profile of the worker that will eventually emerge. The

digital divide is real and growing; the less technology is used, the wider the gap becomes. If technology is to be directed at empowering employees, now is the time that educators and trainers take notice and ensure that the employees, to whom the empowerment is directed, are ready for this challenge.