

Chapter 2

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2 Literature Review

2.1 Introduction

e-Readiness reports indicate that the readiness of countries, regions and communities for computer technology is a worldwide concern (African Education Knowledge Warehouse, 2003; Bridges Organization, 2001; Economist Intelligence Unit, 2005; Mutula & van Brakel, 2005). The concern grew from the effects of the digital divide where a technological gap is visible between so-called developed countries and communities and the lesser technological developing countries and communities. Global entities like the WEF regularly monitors the e-readiness of countries around the world (African Education Knowledge Warehouse, 2003; Global Internet Policy Initiative, 2001-2005; WITSA, 2000; World Economic Forum, 2003; World Economic Forum Consultation Report, 2002). e-Readiness implies that the learners are capable and skilled to use e-learning strategies for their own learning goals.

Strategies of e-learning, new trends such as integration of the latest technologies, implementation and integration in academic and business institutions are discussed in many e-learning related articles. I found fewer sources to guide me to assess the preparedness of a specific group or community. Compared to the theories and strategies of e-learning, not many have focused on the e-readiness aspects (Ifinedo, 2005). Academic research guided me to understand the concept of e-learning, and what the demands on the learners are when they need to be transformed from instructional learning to constructive learning (Alessi & Trollip, 2001; Anderson & Elloumi, 2004; Johnson & Aragon, 2001; Reeves, 1997; Reigeluth, 1996). I am also drawing from the e-learning theory (Anderson & Elloumi, 2004; Nichols, 2003) to assist me in determining what e-learning will demand from the learner. The e-readiness of the warehouse workers can be interpreted against the background of the demands of e-learning.

This literature review focused on the basics of e-learning, what it is, the organisational demands it has and how the infrastructure of e-learning can be used to facilitate learning. It includes the technological requirements and demands it has on corporate companies and the changes it requires from the learners when they move from the known traditional instructive learning to an online learning culture. The requirements of e-learning were used to identify the aspects to look out for to determine the readiness of the warehouse workers. The information from previous and existing readiness reports identified specific aspects to concentrate on to assess the e-readiness of a community. Most of the available reports refer to the readiness of a country or a community at macro level, while less information was found at the micro level of specified communities.

This chapter concludes with a model from Reeves (1999) that has been designed to guide instructional designers in their planning and development of www learning. This model refers to three input areas: aptitude and individual differences; cultural habits of mind; and origins of motivation that

may influence the learning processes to ultimately achieve the needed objectives or outputs (Reeves, 1999). I used this model as a conceptual framework to operationalise my research. The main focus of the research was to determine the e-readiness of the warehouse workers to enable instructional designers in corporate companies to design relevant, attainable online training for the warehouse fraternity.

2.2 e-Learning definitions, models and theories

e-Learning is defined in many ways, and all sources recognise the role of technology, but the emphasis differ according to the purposes of the envisaged training.

2.2.1 Definitions of e-learning

The New Zealand Council for Educational Research emphasised the electronic media in their definition of e-learning:

... learning that takes place in the context of using the Internet and associated web-based applications as the delivery medium for the learning experience (NZCER, 2004 p. 21).

while the Australian Flexible Learning Framework focused more on the learning strategy:

... a component of flexible learning describing a wide set of applications and processes which use any available electronic media in the pursuit of vocational education and training. It includes computer based learning, web based learning, virtual classrooms and digital collaboration (NZCER, 2004 p. 21).

Kahn focused more on the design and delivery of e-learning in his definition: “e-Learning can be viewed as an innovative approach for delivering well-designed, learner-centered, interactive, and facilitated learning environments to anyone, anyplace, anytime...” (2005 p. 3) and added further that learning may be facilitated by means of technology and other available methods.

In addition to these definitions, the Association of African Universities identified the potential to empower the people of Africa, and valued the importance of learning with technology:

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).

This definition is understood against the backdrop of the technological level of African countries (Bridges.org, 2005; Ifinedo, 2005), where technology has not been a priority, because of poverty and other more urgent issues. This definition sees access and availability of technology as a means to empower the people of Africa.

To add to my purpose to explore the e-readiness of warehouse workers, I referred to Bowles (2004 p. 19) where he describes e-learning as follows:

- e-learning encompasses any form of learning transacted by way of digital technologies. (For me this is an indication that e-learning does not necessarily include the most advanced technology that

is available, but can be utilized with what is available and accessible in the warehouse. The SCM industry relies on technology, and do not necessarily need to adjust or update their technology for the sake of training. It may be quite possible to use the technology that is in place)

- e-learning delivery systems are subject to the dynamics of socio-technological evolution
- New training strategies through cellular (mobile) phones and other wireless technology should be considered, or at least how the target groups relate to these. Some learners adjust to technology much easier than others, while traditional face to face training may still be the more comforting strategy for others; and.
- e-learning may be synchronous or asynchronous, self-paced or instructor-led, a process or a single event, online or offline, or any combination of these modes.(Bowles, 2004 p. 19).

The warehouse workers are needed in the warehouse for their entire shifts, barring their lunch and tea breaks. Orders are placed during the day which means that it is difficult to predict when they may leave the premises for a period of training, which makes the asynchronous, self-paced, attributes of e-learning attractive. They do have “slower” days and times, but to leave their premises entirely may be risky.

Bowles concluded by defining e-learning as a “learning experience” that enables the learner to transfer and obtain knowledge by means of technology (2004 p. 19). It included the activity where a learner uses the internet to access learning content, interact with the facilitator and 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). Learners need to be able to interact with the technology and learning content to achieve a desired objective.

These definitions applied to the situation of the warehouse workers. The SCM industry relies on technology to process their business activities and to communicate by means of a structured network, intra- and internet infrastructure. If warehouse workers can access and identify relevant training objectives by means of this infrastructure, it implies that they may already have a level of readiness to benefit from e-learning.

2.2.2 e-Learning models and e-readiness attributes

e-Learning is dependent on effective communication, to ensure that knowledge is successfully transferred and implemented. Bowles (2004) says that e-learning has too easily been described as merely a cost-effective way to present training in modern companies. Company networks were described as an easy way to access information and computer-based lessons were stored on compact disks (CD) with the purpose to be viewed at a learner’s own time and pace, and where it may be convenient. The problem was that the trainer or facilitator is not part of the learning process to lend support. Warehouse workers may not be able to learn without a proper introduction to this strategy.

Models of e-learning:

Anderson and Elloumi (2004) argue that e-learning, as most learning environments, is “framed with the convergence of four overlapping lenses” (Bransford, Brown & Cocking 1999, cf Anderson & Elloumi, 2004 p. 35) The four perspectives are: learner-centred, knowledge-centred, assessment-centred and

community-centred. Online learning, or e-learning is just another form of learning, and is also subject to these four perspectives.

The first perspective, learner-centred learning refers to the notion that a teacher, or in this case the online learning facilitator makes an effort to understand his learners; to understand and determine their prior knowledge, learning preferences and misconceptions. Learning should be focused on the learner, to adapt and accommodate the learner's specific preferences and cultural differences. In other words: "... probing for learner comfort and competence ..." (Anderson & Elloumi, 2004 p. 36).

The second perspective suggested by Bransford, et al (1999) is the knowledge-centred aspect. It refers to the way knowledge is interpreted and understood within the specific context. Thirdly, learning environments should be assessed all the time to provide and ensure quality. Formative assessments also serve to motivate and ensure the relevance of the online material. The fourth perspective, the community-centred lense considers the social learning behaviour of learners, how they may interact to construct knowledge, support and challenge each other (Anderson & Elloumi, 2004).

The main actors in the learning process are the learner, instructor and content. Due to the diversity and different levels of the learners, e-learning may be presented in various formats to achieve objectives. Where learners need more guidance and structure, the interaction may be more learner-teacher, as opposed to a learner-content relationship where the learners are able to work independently. A learner-learner relationship is based on collaborated learning with support and assistance from their peers (Anderson & Elloumi, 2004).

Johnson and Aragon (2001) included the three basic learning theories: the behavioural, cognitive and social learning theories in their strategy framework for an online environment (Anderson & Elloumi, 2004). It means that the online learning or e-learning system needs to make provision for these principles as illustrated in Figure 2.1.

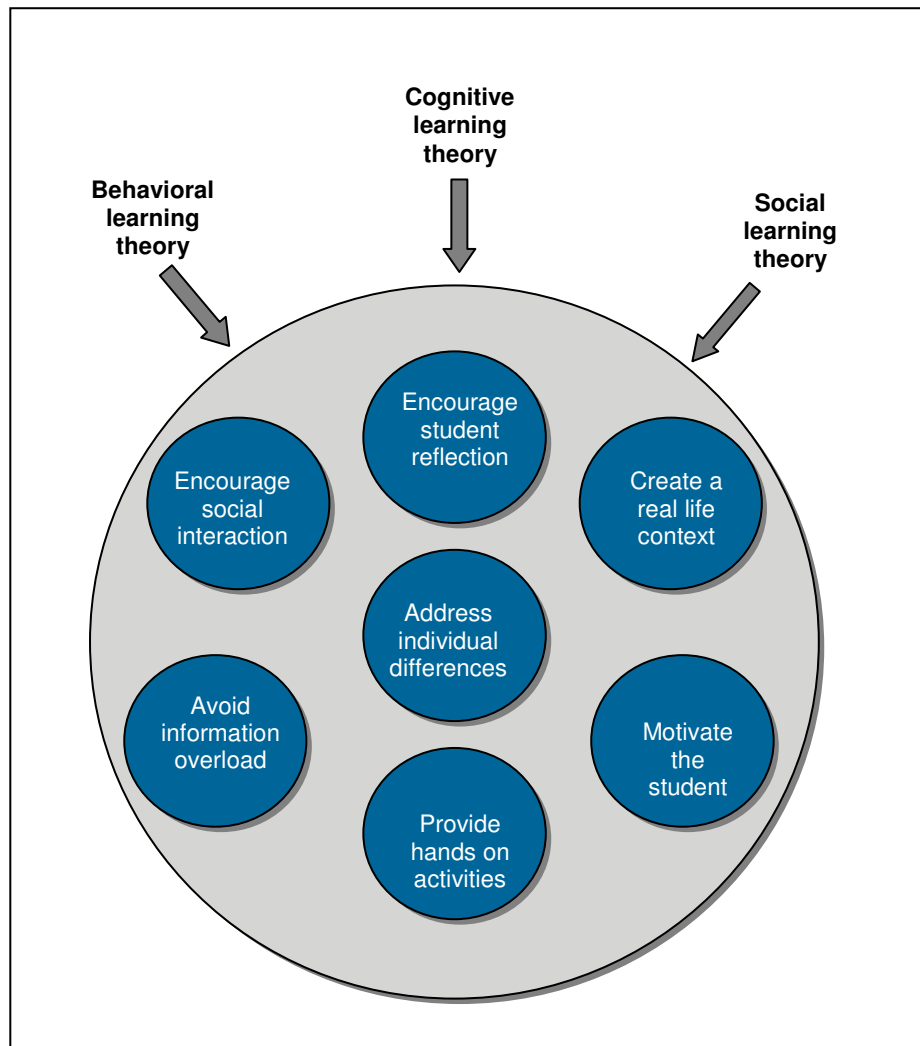


Figure 2.1 Instructional strategy framework for online learning environments
(Johnson & Aragon, 2001)

The principles refer to social interaction, student reflection, allow for unique habits and individual differences, and motivate and create a real life context for the student. A conditioned and e-ready student will be able to utilise such a platform to his own advantage. Table 2.1 illustrates some of the activities involved in e-learning. It illustrates what the online learner can expect (Johnson & Aragon, 2001).

Table 2.1 Attributes of e-learning

<p>Content and strategies providing for individual differences</p> <ul style="list-style-type: none"> Content in multiple formats Individual locus of control over learning material and technology Collaborated knowledge and skill development
<p>Motivation, drawing from Keller’s (1988) ARCS model (attention, relevance, confidence and satisfaction) to keep learning interactive and participative</p> <ul style="list-style-type: none"> Games can be included to serve specific educational and motivational purposes Simulations to re-enact real job-related situations Multimedia can be included to serve pedagogical purposes
<p>Keeping the user motivated and interested</p> <ul style="list-style-type: none"> Chunk learning content into manageable segments Organize instruction around learning cycles Graphic organizers can help students orientate themselves, and hyperlinks can make content quickly accessible
<p>Contextual Learning: knowledge is seen to be a product of the context and content, and this is where meaning and value are created</p> <ul style="list-style-type: none"> Social groups can be formed with peers to form virtual learning teams Reality can be simulated by re-enacting case studies Projects are collaboratively effected
<p>Social Learning: accepting the premise that learners learn best by interacting in a social group</p> <ul style="list-style-type: none"> Personal connection with peers, instructors Feedback and peer reviews assist understanding of new content Facilitate interaction – implying that asynchronous and synchronous communication by means of e-mail and chat rooms are used to facilitate information
<p>Active Learning: can also be described as “learn as you go” or “discovery learning”</p> <ul style="list-style-type: none"> Organize online course around existing projects and responsibilities Think-pair-share is an active learning technique to assist learners to organize prior knowledge, brainstorm questions, and master new knowledge Small group discussions as synchronous communication techniques
<p>Reflective Learning: acknowledged as a higher-order thinking skill, reflection allows learners to “correct distortions in their beliefs and critique”</p> <ul style="list-style-type: none"> Extensive and timely feedback Online diaries or reflective notes (journals) kept.

(Johnson & Aragon, 2001)

Table 2.1 lists several attributes that the e-learner should have to participate in e-learning. The attributes listed in this table may serve as a guide to explore the e-readiness of the warehouse workers. It is a useful reminder of the demands that may be placed on individuals involved in e-learning.

Khan (2005) proposed eight dimensions of e-learning: institutional, management, pedagogical, technological, ethical, interface design, resource support and evaluation. He acknowledged the diversity of the learners and referred to the paradigm shift needed by “Instructors, trainers, administrators, technical and other support staff” (p. 13). Khan created the e-learning framework to

guide instructional designers through the processes to develop, design, implement and evaluate e-learning.

The institutional dimension refers to the academic, administrative (including corporate administration) and student affairs. It includes the needs and readiness assessments to determine the preparedness of the target group. The readiness assessment includes financial, infrastructure, cultural and content readiness of the institution that plans to implement readiness (Khan, 2005). Khan focused on the needs and readiness of the institution and not the readiness of specific learners at that stage.

Khan's management dimension refers to the management of people, processes, and the interaction of people with the content through technology. The technological dimension takes care of infrastructure, hardware, software and managing the access to the infrastructure. The pedagogical dimension refers to the content, transfer of knowledge and knowing the audience well enough to design a strategy (Khan, 2005). The audience analysis is of particular importance because with e-learning, the learners are culturally diverse and respond differently to the learning procedures. It is imperative to understand the learners in terms of cultural backgrounds, ages, interests and educational levels. Designers need to understand how they respond to the instructional methods, and how they will apply the acquired knowledge. Once this is known, designers may have a better idea of the strategy of and approach to e-learning (Alessi & Trollip, 2001; Khan, 2005; Mager, 1991). Surveys, interviews observations and documents may yield information on:

- age
- educational level
- cultural background
- physical and learning disabilities
- learner interest
- experience
- personal goals and attitudes
- learning preferences
- preferred learning styles
- motivation
- writing skills
- reading skills
- mathematical skills
- communication skills
- keyboarding skills
- word-processing skills
- ability to work with culturally diverse learners
- familiarity with instructional methods
- familiarity with instructional delivery systems
- previous experience with e-learning (Khan, 2005 p. 184).

These characteristics can be made applicable to warehouse workers and were used as a basic framework of my interviews and observations. It was possible for me to observe keyboarding skills and the experience with technology. An aspect that assisted me to focus on the skills of the target audience was the fact that the purpose of the intended training was known. Warehouse workers performed basic repetitive procedures to support the business function. When I explored their learning preferences, it was possible to isolate specific preferences, e.g learning with simulations, guided exercises, or training that directly relate to the learning objective.

Khan's next dimension of e-learning referred to ethical issues. Designers need to consider the social and political influences, cultural backgrounds, geographical and learner diversities, effects of the digital divide, etiquette and legal issues (Khan, 2005 p. 293). Especially in countries like South Africa with its political history and cultural diversity, special care should be taken that all cultures are valued and consulted before learning strategies are imposed. South Africa is still regarded as a developing country (World Economic Forum, 2003) regardless of the fact that it was rated to be the most e-ready country in Africa (Bridges.org, 2005; Ifinedo, 2005; World Economic Forum, 2003).

Interface design dimension is important in that it is the "look and feel" of the e-learning and may play an important part in the acceptance of the strategy. Lohr (1998) (cf. Khan 2005) suggested three roles of the interface: to orientate the learner with regard to content, assist learners and to navigate, to provide feedback. The interface design plays an important role to make the learner feel comfortable and in control. Especially when the users have limited computer knowledge, interface designs can be very intimidating. When the learner is able to identify a topic easily, it paves the way for further exploration (Khan, 2005). It is important that learners should grow in confidence, learn as they go and accept feedback.

The next dimension listed by Khan is the resource support dimension. The importance to support learners whenever they need assistance is seen to be very important, especially where inexperience may lead to anxiety (Khan, 2005). Support include technical, counselling and guidance (Adendorff, 2005). Learners initially need a lot of guidance on time and stress management (Khan, 2005). Khan's ninth dimension referred to the evaluation of processes, products and the people. The evaluation includes the formative and summative evaluation of the plan, design, strategy, delivery, support and success of the e-learning. The assessment of the readiness of the target audience – in this case the warehouse workers – should be conducted thoroughly before the e-learning strategy is decided.

Bagnasco, Chirico, Parodi and Scapolla (2003) included three levels in their model of e-learning. Level 1 – the presentation level where the learner/user gets access to the learning material. The middle level includes the managerial structures to organize and control access to and from learners, managers, authors, instructional designers and IT engineers. The third level refers to the area where content or learning material is prepared (Bagnasco *et al.*, 2003).

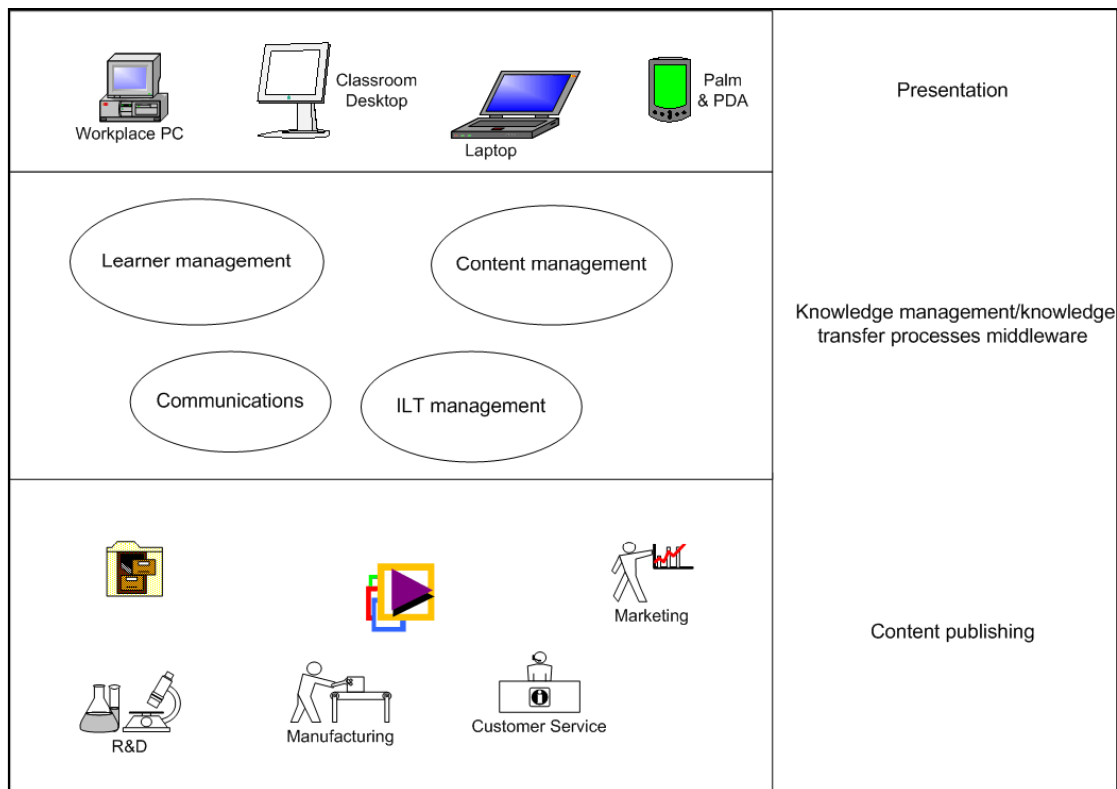


Figure 2.2 Three levels of e-Learning model (Bagnasco *et al.*, 2003)

Bagnasco *et al* (2003) designed the three levels to guide the implementation of e-learning in a workplace. Khan's model can be integrated into these three levels to indicate the responsibilities of the instructional designers with regard to institutional, management, pedagogical, technological, ethical, interface design, resource support and evaluation dimensions. For the instructional designer to be able to present the e-learning in level one, thorough planning and development should precede the implementation. Khan's (2005) dimensions cover a wide spectrum of aspects which need to be addressed to realize e-learning.

As the receiver of the presentation, the warehouse worker as primary user needs to be competent in the attributes as listed by Johnson and Aragon. The e-learner needs to be competent and skilled to use the presentation optimally and benefit from the interaction. Competencies include taking control and learning from multiple formats, know how to open and use multimedia to construct knowledge, communicate and collaborate with co-learners. He/she also needs to manage time and exercise discipline to complete projects in time. The learner becomes an active participant and the primary driver in his learning programme. To present e-learning to any group without a proper needs analysis, in this case more a target group analysis, can be a costly mistake (Alessi & Trollip, 2001; Khan, 2005; Mager, 1991). The profile or characteristics of the target group should be thoroughly analysed before any investment in e-learning is made. Khan proposed a list of characteristics to be investigated by means of observations and interviews to determine the viability of e-learning for a potential target group.

Aspects to consider throughout this analysis are the fact that e-learning has advantages, but also some disadvantages. Only when the disadvantages and advantages are juxtaposed against the readiness of the target group, can instructional designers make a knowledgeable decision on the viability of e-learning.

2.3 Advantages and disadvantages of e-learning

e-Learning holds many advantages such as own tempo learning, individual style of learning, own time and include cost saving for companies (Alessi & Trollip, 2001; Anderson & Elloumi, 2004; Bowles, 2004). But disadvantages exists, therefore e-learning can not be imposed onto a learning community unless all benefits and disadvantages have been considered.

2.3.1 Advantages

Macpherson, Homan and Wilkinson (2005) reduced the advantages into two main themes, namely cost advantages, and flexibility in delivery. Cost refers to the much-used argument of taking the content to the learner, and flexibility refers to access, method of delivery, speed and strategies of instruction. Cost and development time, due to repeatable use, and easy updating are seen as advantages in the corporate environment as are flexibility, customisation, and collaborative learning (Alessi & Trollip, 2001; Bennet & Bennet, 2004; Mashile & Pretorius, 2003). Communication with experts in the field of study is possible with e-learning (Anderson & Elloumi, 2004).

Advantages include asynchronous, anywhere-anytime, own tempo learning, real time interaction with co-students and instructors, and control over the learning process (Alessi & Trollip, 2001; Anderson & Elloumi, 2004; Bowles, 2004). The advantages e-learning holds for “a geographically dispersed workforce” are probably one of the most appealing features of e-learning. Corporate companies started to post courses onto their intranets and the World Wide Web (www) to present training. Traveling and bringing students to a centralized learning venue is a costly exercise for companies, and the idea of decentralized, online training seems to be very good financial option to take.

Academic institutions and corporate companies have different objectives for e-learning. Bowles (2004) mentions that learning in academic institutions has been organized around self-contained subjects, while the corporate sector make more use of smaller units of knowledge, also referred to as knowledge objects. This makes the re-using of knowledge objects possible. Re-using refers to the practice where course knowledge objects played a role in a specified learning environment; it can be reapplied in another context for another learner. Corporate companies are interested in this because it saves costs, and has an impact on quality (Cook & Heacock, 2003; Gill, 2003). These knowledge objects or building blocks (Ifinedo, 2005) can be easily updated and maintained. When broken down into smaller units, also known as chunks, it may be usable in other themes. Themes or content can be broken down when e-learning is used as strategy to train.

The SCM business areas are divided into functional areas and can be broken into knowledge objects or chunks. The warehouse functional procedures are performed by different teams respectively (refer to figure 1.3). The receiving team has their own basic procedures to perform, and this differs from the procedures performed by the manifesting team where stock is packed, invoices generated and sent to the logistics teams for delivery. Procedures are short and system supported, but need skill and accuracy to provide for the demands of the SCM industry. e-Learning's attribute of chunking can be successfully utilised in the SCM environment. Wiley (cf. Bowles, 2004) cautioned that the knowledge objects can not be assembled and connected indiscriminately, it requires expertise to keep the structure meaningful and the objectives clear. Skilful instructional design and expertise is needed for this.

Where earlier e-learning was restricted to text based tutorials, increased bandwidth has enabled current e-learning lessons to make more use of multimedia (Cook & Heacock, 2003). Learners have the privilege to receive information in creative ways. The warehouse workers used practical procedures and were used to physical processes. The use of multimedia in an e-learning strategy may appeal to them.

2.3.2 Disadvantages and myths of e-learning

Opportunities to develop and design online learning appears to be endless, but can only be beneficial if the needs, skills and e-readiness of the learners are fully understood and taken into account. To imply that these technologies may automatically benefit the warehouse worker may be very naïve and uninformed. Bowles (2004) stated that e-learning programs have sometimes been criticized to be ineffective, and "poorly conceived and designed" (p. 17). Some delivered a lot less than initially promised. Technology became available, and in many cases the technology took precedence over the intended learning where "one-size-fits-all electronic solutions" (Bowles, 2004 p. 17) were introduced to save money.

Gill warns that e-learning has become the "big new thing in the training and education field" (2003 p. 20) and created a wave that urged trainers and companies to get involved as soon as possible. Vendors' participation at the 2001 Online Learning Conference increased from approximately 3000 in 1999 to approximately 9000 in 2001. These quick, immediately available solutions are viewed with suspicion and adds fuel to the fire of some e-learning critics, and do not appeal to professional educationists and training facilitators (Bowles, 2004; Cook & Heacock, 2003).

Not all content lends itself to be broken down into chunks without compromising the true meaning of the learning strategy. When learning objectives are broken down, special attention and care should be taken to ensure that the knowledge objects do not become isolated from one another. It may lead to the LEGO block analogy (Bowles, 2004).

Wiley (cf. Bowles, 2004) warned that the knowledge objects cannot be assembled and connected indiscriminately, it requires expertise to keep the structure meaningful and objectives clear. Skilful instructional design and expertise is needed for this.

Bandwidth refers to the amount of data that can be transmitted in a fixed amount of time. Bandwidth is a major issue for e-learning because it determines the speed at which sound images, video and text can be sent or received (Bowles, 2004 p.14). In many developing countries, bandwidth is controlled by the government because the financial implications are huge. This puts a restriction on the extent to which e-learning can be developed and dispersed, because if the bandwidth restricts the sending of multimedia, it restricts the instructional design of the learning objectives. "For users of the internet, the content and services that can be accessed are dictated by the bandwidth available" (Bowles, 2004 p.14). In South Africa, companies are dependent on the government's stance on the public radio frequencies. Up to 2006, Telkom, the national telecommunications department, has been the sole provider of communication technology in South Africa. WEF reported the communications in South Africa to be insufficient even though the country has been identified as a category 1 country regarding its e-readiness, but lacks a second or even third provider (World Economic Forum, 2003). All companies in South Africa are subjected to the available bandwidth. The government has been under pressure to appoint a second provider and talk is that such a provider will start doing business later in 2006. During his opening of parliament speech on 3 February 2006, president Thabo Mbeki promised that a second telecommunications network will become a reality in 2006.

Gill pointed out that the preoccupation with e-learning led to several myths regarding e-learning: classroom training can not be transformed into e-learning; e-learning classes are as good or even better than face to face presentations; all learners learn well with e-learning; e-learning courses are cheaper to deliver; working and learning are separate activities (2003 p. 21). To imply that e-learning will be the solution for teaching warehouse workers without good and accurate research may lure one to get trapped by all the myths listed above.

The warehouse learners each have idiosyncrasies, are motivated in unique ways, have different learning styles, therefore a thorough research is necessary of how they will adapt to e-learning before it is implemented in any way. This includes the requirements that e-learning will pose to them, and the skill and competencies they will need to be successful.

2.4 e-Learning and the digital divide

Considering the complexity of e-learning, the question may be asked whether it may be a viable option to introduce warehouse workers to this learning strategy. Educationists may feel morally compelled to teach and introduce learners to e-learning, while the corporate companies will consider the financial obligations first. Globalisation caused companies to move away from a localised environment and introduced employees to an environment with "porous boundaries across the globe" (Thomas & Inkson, 2004 p. 7). A community such as the warehouse workers is exposed to the requirements of a

highly technological environment, and consequently find themselves immersed in the digital divide. The effects of this digital divide is a world-wide concern (Huckle, 1997; Rao, 2001; Resnick, 2002). In South Africa, legislation and Employment Charters insist that the black South African communities be involved in technology as soon and often as possible (ICT Charter, 2004).

2.4.1 South African legislation and the ICT Black Employment Charter

Questions are asked about developing communities' capacities and infrastructures to assist in establishing e-learning. This gives reason for policies to be drafted and put into place (Henrici, 2004). Workplace Learning is promoted and supported by the SA Department of Labour and the Skills Development Act. South African legislation demands continuous training and development of local employees:

- Employment Equity Act 55 of 1998, which strives to promote equity in the workplace
- which provides a strategy to develop and improve the skill-base of the SA workforce
- Skill Development Levies Act 9 of 1999, which obliges employers to pay one percent in levies for training and development of its employees
- Preferential Procurement Policy Framework Act 5 of 2000, which promotes 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).

The ICT Black Employment Charter drafted in May 2004 warned that South Africa has dropped from 97th to 107th position worldwide in its provision of skilled labour, despite an aggressive national skills development policy (ICT Charter, 2004). The Charter also bemoans the fact that only twenty nine percent of African school leavers are able to secure jobs, despite skill shortages. It calls for a joint development of skills in the ICT sector, and sets the following goals:

- ensure that skills development and training programmes mirror job demands
- ensure that the institutions that supply ICT's are on track to provide what the market needs
- promote awareness of career opportunities
- set clear and precise guidelines for effective skills development initiatives, and
- assist the Information System Education and Training for Technology Sector for Education and Training Authority (ISETT SETA) and other SETA's relevant to the ICT sector in formulating partnerships between enterprises, training providers and itself to embark on learnerships to address skills shortages (ICT Charter, 2004).

The ICT Charter observed that South Africa is dropping behind other developing nations such as India, Taiwan and China in establishing a viable and solid ICT infrastructure. The Charter argued that the ICT sector in South Africa contributes less than ten percent of the gross development product (GDP), as opposed to leading developed countries. They added that only ten percent of the companies really promote and implement empowerment of their employees. The Charter pleaded for an "entrepreneurial focus" to develop a society that can adapt to modern demands and eventually create jobs and opportunities for their communities (ICT Charter, 2004).

2.4.2 Reports on the divide

The Southern African Development Community (SADC) – World Economic Forum (WEF) Consultation Report regarded South Africa as a developing country that needs to bridge the digital divide. The

majority of the population in South Africa is black, and statistics indicate that they lag far behind their white counterparts in access to technology and Internet usage (Ifinedo, 2005; Wasserman, 2003).

Table 2.2 Internet use in South Africa April 2000

Population group	% Internet use at work	% Internet use at home
White male	12,2	12,8
White female	10,6	12,2
Black male	0,2	1,8
Black female	0,2	0,4

(Wasserman, 2003 p.89)

The World Information Technology and Services Alliance (WITSA), a consortium of IT industry associates from countries around the world, reported in 2000 that the shortage of a skilled workforce is a threat to the modern industry. Training and education for employees is regarded as a priority for sustained growth in the future – by means of interactive media and distance learning. Life-long learning is seen to be essential for everyone (WITSA, 2000).

In January 2002, the WEF reported on the e-readiness of the SADC, stating that the integration of information and communication technologies can be a solution to poverty and may be a key instrument in empowering the developing communities (World Economic Forum, 2003; World Economic Forum Consultation Report, 2002). The WEF Reports used policy, infrastructure and ground initiatives to probe e-Readiness, and found that education is an issue that affects all these areas. This is in line with the Digital Opportunity Task (DOT) Force and WITSA reports that identified training and education as a key factor to bridge the divide. WEF (2002) found the following regarding the South African e-readiness situation:

Table 2.3 Summary of country-specific recommendations

Policy framework	Infrastructure	Ground-initiatives
Liberalise ICT industry, Implement empowerment policies in line with RDP objectives.	Prepare for roll out of second national operator. Utilise universal service fund for rural connectivity and tele-centre sustainability.	Provide more e-education and training, as well as entrepreneurship development projects in rural areas.

(World Economic Forum Consultation Report, 2002)

The New Partnership for African Development (NEPAD) e-Readiness programme lists South Africa, along with Egypt, Botswana, Mauritius and Tunisia, as category 1 developing countries. NEPAD is a government initiative to join forces to address economic and sociological issues in Africa. Category 1 comprises countries that have introduced legislation that helps the growth of access and affordability of ICT. They are also regarded to be amongst the most socially and economically advanced countries in Africa. But, “it is important to note that even within these countries there remain a digital divide, usually based on geographical (rural/urban), socio-economic or cultural factors” (World Economic Forum, 2003 p. 13).

In *Digital Opportunities for All: Meeting the Challenge* (Digital Opportunity Task Force, 2001), the G8 countries propose the following plans to assist in bridging the divide; firstly, by accepting that technologically advanced countries have a responsibility to assist developing communities to grow. What is of particular importance is Action Plan 3, as stated by the Digital Opportunities Task (DOT) Force: “Enhance human capacity development, knowledge creation and sharing” which calls for:

- promoting ICT among children in developing countries
- training teachers and growing digital literacy by promoting e-learning as a powerful educational strategy
- expanding opportunities for training, education and knowledge sharing
- concentrating on deprived and illiterate communities
- developing networks with relevant education communities
- enhancing life long and distance education to promote vocational training, and
- growing and developing an awareness of knowledge and learning (Digital Opportunity Task Force, 2001 p.3).

The annual report of the Information for Development Program (InfoDev) of 2003 lists several “Lessons learned” (p. 9) and recommends some guidelines to implement technology in developing communities. One of these lessons is the involvement of the locals, to get a clear indication of what they expect, how they want to go about in achieving a shared goal. Even more important is to empower them to develop their own content and methodology (Information for Development Program, 2003). Guidelines to establish technology in developing communities:

- technology is a tool to be used to reach an objective
- local communities need to be involved, to determine what information should be included, and which technology will be the more appropriate
- community should discuss how the integration will affect the power balances and existing culture
- involve the community continuously during progress to adapt where necessary
- develop content for large groups
- utilize locally available technology and keep it simple
- link ICT projects to local objectives, public and private organisations
- ensure that infrastructure is in place, and
- incorporate plans to monitor, evaluate, and assess impact of the interventions frequently. (Information for Development Program, 2003 p. 16).

The involvement of the local community, or the intended target group is advised:

What is important is the claim that a bottom up pattern of development – driven by the private sector, moderated and monitored by civil society, and enabled by government – creates new opportunities and the potential for empowering positive change in human society on a scale unprecedented since the end of the Middle Ages. We can’t prove it, of course, but if bottom up development is at least a plausible and hopeful paradigm for a better world, then it deserves careful study and active experimentation (Hammond & Jenkins, 2001).

The indications from existing reports are that developing communities should be allowed to participate in technology, and that their input should be considered when any training with technology is planned.

2.4.3 Supply-chain management industry depending on technology

Organisations initially functioned as single units, but due to the introduction of computer technology, the traditional borders disintegrated gradually. Customer demands across the globe grew, clients and customers have the privilege of updated information and knowledge of products, procedures, growth and offerings (Turban *et al.*, 2001). Organisations closed new partnerships and information networks

to ensure that they are on the forefront of industry, to compete for business and to be attractive to potential clients. Large sums of money are being invested in information technology to be competitive (Turban *et al.*, 2001). This practice makes organisations world players and places them in the midst of globalisation.

2.4.4 Globalisation

Technology exposes developing communities to the digital divide (Huckle, 1997). The digital divide is prominent due to globalisation. Globalisation is seen as the result of the movement of people and businesses across traditional borders, where people of diverse cultures interact and do business (Stalder, 2000; Thomas & Inkson, 2004). Communication and modern transport enable people of different cultures to meet and do business on a daily basis in order to survive in a highly competitive world. Cultures are more aware of one another, and perceive that the environment has changed (Thomas & Inkson, 2004). With the creation of the internet, the cultural borders have diminished even further, to such an extent that a fear has grown that smaller cultures may be entirely swallowed by a global seamless culture (Ntuli, 2002; Wasserman, 2003).

Castells refer to this as the “Network Society” (Huckle, 1997) and explains this society as the result of the internet and communication technology (Huckle, 1997; Stalder, 2000). Castells describes this networked society as:

- determined by “an Information economy”, where companies depend on the availability of technology to compete and survive against other firms in the world
- global economies that arose due to the fact that the economy is timeless and without any cultural or physical borders.
- “network enterprises” which comprise international firms and institutions that are linked to form networks of information and knowledge sharing.
- fourthly, the information network brought a change to employment structures where individual skill, self employment, intrinsic motivation plays a major role.
- social polarisation and even exclusion of societies, where the societies without technology are exposed and feel threatened.
- information cultures where societies with access grow a unique culture because of their connected status.
- a powerful platform for politics and to convey important information.
- timeless and not bound to time zones or cultural borders, and
- formation of social domination of the societies that has access to technology as opposed to the marginalization of the societies who do not have this privilege (Huckle, 1997).

Gunn (2005) argues that globalisation is fundamentally concerned with change. These changes can be either rejected as a result of being threatened, seen as an interaction between cultures or modified to benefit the smaller cultures (Cullingford & Gunn, 2005; Wasserman, 2003). Examples of these changes are mobile and wireless technology. Mobile, wireless communication media has entered the market in the last few years. These changes include handheld devices such as personal digital assistants (PDA) which are small computers and storage devices. Mobile or cellular phones have developed into powerful communication tools with their ability to send and receive multimedia. The “wireless and mobile” technologies have even developed further than the www, in that access is possible from any place in the world that is supported by this technology. Mobile technology takes the access to information even to a higher level (Bowles, 2004).

The integration of technologies has developed into a powerful information and communication infrastructure. The www and computer technology now integrate with television, radio and telephone technology. Where telephone connections were dependent on physical wires and infrastructure, wireless technology is much faster with “rapid connectivity and accelerated access” (Bowles, 2004 p. 12). SCM companies need to attract customers and accept the new technology to improve their competitive edge. To attract new clients they need to show a proficiency and capability to accommodate the needs of the potential client. The introduction of these modern technologies serves as a constant reminder to companies and training institutions in how their respective disciplines can benefit.

Differing views on globalisation

Critics acknowledge that it has given rise to the digital gap to reveal differences between the “haves”, and “have nots” (Gurstein, 2003; Hoppers, 2002; Khan, 2005; Ntuli, 2002; Thomas & Inkson, 2004; Wasserman, 2003). Gurstein warns that a belief exists in the United States of America that the gap is being closed after technologies have been made accessible to poorer communities, but in reality thirty to forty percent of the population in the USA is still without access, and remind us of the millions in developing countries who do not even have access to electricity (Gurstein, 2003). Hountondji and Hoppers give an African perspective by regarding globalisation as a threat to Indigenous Knowledge (IK) (Hoppers, 2002). Slavery and apartheid has left marginalised communities suspicious and wary of globalisation:

Moreover, for a great majority of the population of Africa, the loss of cultural reference points has culminated in the fundamental breakdown of African societies, with dire consequences for the social and human development project as a whole. Finally, globalisation is threatening the appropriation of the collective knowledge of non-Western societies into proprietary knowledge for the profit of a few (Hoppers, 2002 p. 3).

Cullingford regarded the globalisation process not to be “downward on developing nations” but rather as a trans-cultural process where both local and dominant cultures should participate. Gunn explained it as “not in one direction”, because it influences all cultures, and is not only concerned with the present, but also the future. He added that improved technology has influenced the entire world and not only isolated nations. Where nations acted autonomously in earlier times, this is not the case anymore (Cullingford & Gunn, 2005). Harrison (2002) cf. Gunn (2005) sees the globalisation process in terms of three main influences:

- technology opened the information gateway between countries, companies and sped up the business procedures.
- global finances that made the closing of transactions and payments quicker and more accessible from different geographical locations, and
- “the establishment of global free markets leads to improved efficiency in industry and an improvement in standards of living...” (Cullingford & Gunn, 2005 p. 1).

The concern many people have is that the technology is mostly owned by an elite group, and they may use this vantage point to enrich themselves (Hoppers, 2002; Wasserman, 2003). It again results in the argument of those who have against those who don't, which is the basic essence of the digital divide. Thomas and Kerr (2004) speak of a “porous” environment where traditional cultures are not

visible in businesses anymore, and argue that it places a huge premium on interpersonal skills to respect and utilise the cultures for the benefit of the business.

The warehouse workers find themselves in the centre of this argument. They are subjected to technology in that they have to perform electronic business tasks to support modern companies. The companies on the other hand need to conform to the requirements of modern businesses, be competitive or lose out. Warehouse workers in South Africa are virtually “representatives” of the divide.

2.4.5 Digital divide

The description digital divide implies ‘absence of technology’, According to Weeks and Lessing (2002):

... 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.

The gap grows and expands due to the extensive use of computer technology by the higher socio-economic communities (Van Dijk, 1997), or as pointed out at the Kyushu-Okinawa Summit in July 2000:

This digital divide is, in effect, a reflection of existing broader socio-economic inequalities and can be characterized by insufficient infrastructure, high cost of access, inappropriate or weak policy regimes, inefficiencies in the provision of telecommunication networks and services, lack of locally created content, and uneven ability to derive economic and social benefits from information-intensive activities (Digital Opportunity Task Force, 2001).

The difference between the developed and developing learners leaves educators with a responsibility. As Gawe and De Kock commented:

Globalisation is not about a choice between playing and looking on, but at times when as human beings we find ourselves confronted with overwhelming circumstances, we bury our heads in the sand (Gawe & De Kock, 2002 p. 36)

The WEF (2002 p. 8) urged developing nations to pursue e-Readiness and promote the use of technology. Technology can be a solution to economic and social problems when people are empowered and know how to get by on their own. There is always the possibility of being left further behind, or as put by Warschauer (2002) “lack of access to computers and networks harms life chances”.

Gurstein (2003) proposes the concept of Community Informatics (CI) to empower people, develop communities, and make organisations prosperous. Evidence of the digital divide exists to indicate that a special and innovative strategy must be followed to enable developing communities to become digitally prepared to close the existing gap. Gurstein (2003) wrote that geographically-based communities have their own characteristics, requirements, and opportunities that require their own unique ways to implement ICT. As described by Herselman and Britton “The imperative and overwhelming task facing both the global and development community is finding ways to bridge this divide and wire the poor, whose livelihoods could be enhanced through access to technology”

(2002 p. 271).

Cronje (2004) illustrates the divide in Figure 2.3, by showing two extremes – localisation and globalisation opposing one another. If globalisation does not consider local needs and requirements, the gap may deepen, and developing communities' situations may worsen. On the other hand, if local communities ignore, or do not address the existing gap, they may find themselves wanting and prone to marginalisation. The very same “technologies that cause the rift are perhaps the very tools that can be used to bridge this ever-growing and urgent divide” (Herselman & Britton, 2002 p. 271). The ideal scenario would be that the developed world recognises the technological needs of local communities, and include them on several levels of integration and development to work in a strategic and effective operation to bring the processes of globalisation and localisation closer together.

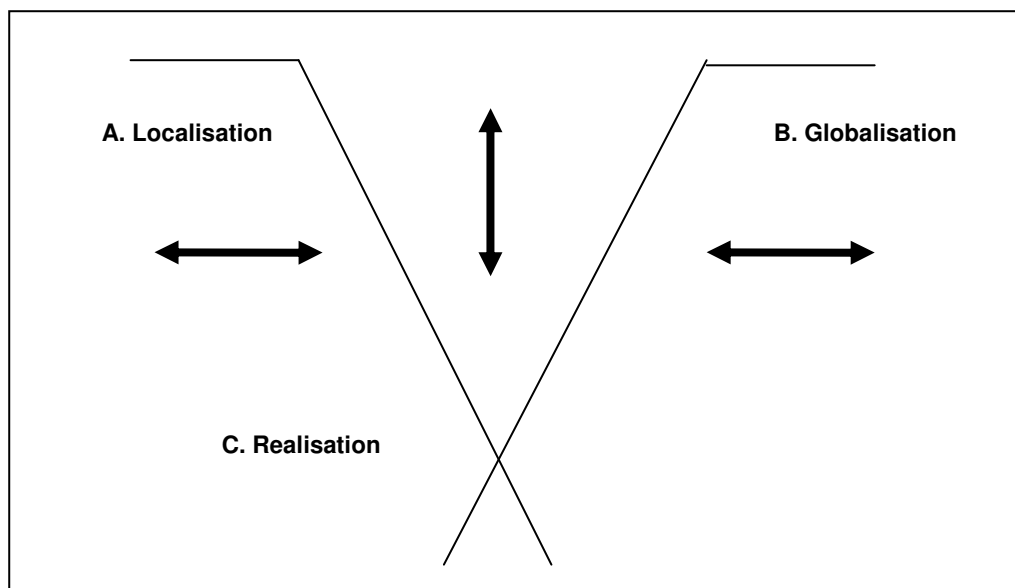


Figure 2.3 Localisation and globalisation (Cronje, 2004)

Gurstein suggested that a community may be empowered through CI to overcome the effects of the digital divide. It involves a process of investigation in “how and under what conditions can ICT be made useful and usable to the range of excluded populations... particularly to support local economic development ...” (Gurstein, 2003 p. 4). Ifinedo wrote that African countries can not afford to stand by and watch as technology is used by the rest of the world. Avgerou (1994), cited by Ifinedo (2005), wrote that the developing countries are increasingly disadvantaged by a lack of technology, shortfalls of skills, and telecommunications

The warehouse workers are a community on their own, with their own characteristics and working culture. The longer they are excluded from using technology to their own advantage, the more difficult would it become to stay abreast with fast-changing techniques and technology to support the day to day functioning at the workplace. Strategies should be launched to identify their readiness and to include them in the network society. If the readiness factors are known, a plan can be designed to launch e-learning initiatives for developing communities.

As governments seek to transform their societies and empower local communities, the challenge becomes one of how to *operationalise empowerment* itself in a context in which diverse knowledges are barely tolerated and exist only in sufferance and subjugative deference to mainstream, essentially Western form of knowledge – that is safely installed as the only way of seeing, and the only tool by which the masses of humanity can receive accreditation and a license to *be* (Hoppers, 2002 p. 14).

Here Hoppers (2002) takes a very strong standing by regarding Western influences as threatening. She also added “The legacy of Western rationalism is no longer unchallengeably dominant, and it’s universal validity is now under question” (2002 p. 14). This suspicion may be directed against academics such as Ifinedo (2005), Poirier (2001) and the InfoDev program (Information for Development Program, 2003) who supported the urgent integration of technology, by stating that Western influences need to be integrated into the environments of the developing countries to act as an empowering agent. Whether this is accurate or not, it shows that there are communities that need to be introduced to technology, but certainly not at the cost of their own cultures and values.

2.5 Bridging the gap with the introduction of technology

e-Learning is increasingly implemented across the globe. Academic institutions move towards e-learning strategies and do research to assess the viability, while corporate companies introduce technology in areas to speed up development in developing areas.

2.5.1 Case studies of developing communities

Appendix 2.1 illustrates several case studies where technology is assessed or implemented to assist in the development of communities. The purpose of these case studies is to indicate the unique problems that may arise when technology training is planned and/or implemented. The first report, by Mashile and Pretorius (2003), investigated online learning and the readiness for this educational strategy at the University of South Africa. The second study by Burton (2002) reported on two case studies of rural communities and their experiences with technology, while the third study, by Coco and Jolly (2003), showed a disadvantaged Australian community’s preparedness level for technology. Then follows Herselman and Britton (2002) who discussed the impact of ICT on lower socio-economic groups, and Heydenrych (2000) investigated the readiness of Unisa as institution to present their academic courses online. This is followed by comments and concerns from Llorens, Salanova and Grau (2002) to indicate the readiness of the labour force to learn and adapt in a competitive, global business environment.

Mashile and Pretorius identified student characteristics to be a core element to ensure success. They acknowledged that the divide cannot be addressed without technology, and “new technologies are gradually reducing the gap between teaching and learning” (Mashile & Pretorius, 2003 p. 133). They believe they created an awareness of this medium for studying and vocational purposes. Learners from deprived socio-economic backgrounds developed valuable computer skills.

Burton discusses the challenge posed to South African communities in *Development at any Cost: ICT’s and People’s Participation in South Africa* (2002). Burton reminds us that although e-Readiness

is a growing concern worldwide, a sound foundation to build a new knowledge base is not yet in place in South Africa. He argued that the economic infrastructure of South Africa was characterised by:

- high levels of poverty
- high levels of illiteracy
- a society driven by global economic demands, but held back due to historical exclusions
- slow and uneven development
- cultural diversity (Burton, 2002 p. 43).

Jordan's (n.d.) plea to "learn or perish" comes to mind. Burton argues that the previously disadvantaged groups should be armed with knowledge in the form of technology. This can involve them in the globalisation process.

On the international front, Coco and Jolly undertook a research study at Indy State in Queensland, Australia. From their findings one learns that the project has been partially successful, but frustrations surfaced because the "solution" to bridge the divide was not met with the same enthusiasm and vigour that the researchers had hoped (Coco & Jolly, 2003). Regardless of limited success, an awareness of computers has been created, the viability to install and run a computer centre has been established, and several aspects can be learned from this study. It is interesting to note that the readiness level of the community had, however, never been determined before.

In South Africa, Herselman and Britton regarded the origin of the divide to be educational, and investigated the role of ICT in education. Technology, if used correctly, can accelerate learning. Educational techniques include "distance learning, home schooling, multimedia classrooms and service projects" (2002 p. 271). Several interesting restricting factors emerged from this study:

- a feeling of exclusion from the developing communities
- lack of confidence when compared to advantaged communities
- threat to traditional indigenous culture
- access to technology is wanting (Herselman & Britton, 2002 p. 271).

Macpherson et al (2005) and Powell (2000) investigated the implementation of e-learning in corporate environments. Questionnaires and interviews led them to the employees who were earmarked for e-learning in their respective companies. These researchers determined that disadvantages were largely ignored and that it is advisable that "organisational readiness" should be established before the implementation of e-learning. Learners often do not have the skills to sustain their own development. They also found that despite the slow progress, e-learning is being implemented more and more by a lot of companies. They found that management support is crucial for the success of e-learning. Research should be conducted within the company to ensure that relevant training is made available (Macpherson *et al.*, 2005).

2.5.2 Lessons learnt from previous studies

Where do these studies leave this research? Several aspects emerged that were experienced in all of these case studies:

- target group needs and characteristics should be known before implementation
- technology can be used to develop and empower individuals and/or communities
- the gap widens the longer the issue is ignored

- prior research must ensure that the problem is understood.

These findings illustrate that the exercise to implement technology was not in vain, but showed the way to improve the strategies and how to involve the learners from the start. The following recommendations emerged from these cases:

- Technological education and training should continue regardless of setbacks (Burton, 2002; Coco & Jolly, 2003; Herselman & Britton, 2002; Heydenrych, 2000; Llorens *et al.*, 2002; Mashile & Pretorius, 2003)
- Training must be relevant for the individuals and the environment (Burton, 2002; Coco & Jolly, 2003; Herselman & Britton, 2002; Heydenrych, 2000; Llorens *et al.*, 2002; Mashile & Pretorius, 2003)
- The target group needs to be involved in needs analysis and planning stages (Burton, 2002; Coco & Jolly, 2003; Herselman & Britton, 2002; Heydenrych, 2000; Llorens *et al.*, 2002; Macpherson *et al.*, 2005; Mashile & Pretorius, 2003)
- It is imperative that the initiators understand the situation, the target group's position, aspirations, habits, attitudes, levels of competencies, objectives and integrate these with the business goals (Burton, 2002; Coco & Jolly, 2003; Herselman & Britton, 2002; Heydenrych, 2000; Llorens *et al.*, 2002; Mashile & Pretorius, 2003).

A bottom-up approach is advocated, meaning that no strategy should be considered before a thorough needs analysis has been conducted. This analysis needs to focus more on the learner, to ensure that the needs of the learner is addressed and not "ignored in the enthusiasm of technology" (Macpherson *et al.*, 2005). Llorens, Salanova and Grau (2002) added that the needs analysis should not focus on a short-term solution, training for the workforce should be permanent or focused on the future. To be permanent, it means that e-learning should become a habit at the workplace, and part of the cultural society. Holstrom reiterated the value of e-learning:

Distance education can transform lives of the less privileged among us. e-learning can be empowering and self actualizing, building a bridge across the digital divide to span not only technological deficits, but also educational, social, economic, and career –opportunity gaps (2003 p. 61).

e-Learning is promoted, discussed, sold, used, and in some cases commanded, as a learning strategy in many organisations without giving enough thought to the user's skill or readiness to utilise this new learning strategy. Hence the comments in the information technology monthly magazine Business IT Africa of January 2002:

Education and training, especially in the African context, has traditionally been hamstrung by the need to reach large numbers of learners in remote areas and with a minimum of trainers. Technology has long sought a way to alleviate these strains, through the early development of computer-based training and now with its online counterpart, e-learning. The race is now on to set up e-learning centres in remote, rural and disadvantaged areas; the implementation of which is expected to have an immediate and measurable impact on the South African economy (Business IT Africa, 2002, p. 16).

Needs analysis means that all aspects of the target group should be investigated; especially the preparedness or readiness for the planned education strategy. It also serves as a good indicator to know where intended training should start, and how to structure the course (Mager, 1991).

2.5.3 Involve the learners

The recommendations listed above lend sufficient support for an approach where the target group should be involved in their own destiny. This is described by many sources as a bottom-up approach, or in the words of Heydenrych (2000 p.8), "What is needed in the new, evolving South African society is that learners indeed become collaborative developers of their courses through reflection and

interaction with their lecturers.” Nulens (2003), who studied mass media influences to close the divide, recognises the strength of a unique society and its ability to create an own development process “based on principles such as basic needs, self reliance, ecological and sustainable development, participative democracy, and indigenous culture” (p. 73). He warns against a top-down strategy. Several resources need to be involved and consulted in a process to promote access to technology (Warschauer, 2002). This involves the management, learners, technical staff, and training department. Llorens et al (2002) appealed to the training fraternity to plan from the worker’s perspective. Czerniewcz and Brown (2005) remind us that efforts to bridge the divide are primarily about people, and not technology. Mashile and Pretorius (2003) cautioned that non-participation will be counter-productive.

Figure 2.4 positions the warehouse workers’ e-readiness in the context of South Africa, the Supply Chain Management industry and Information Technology.

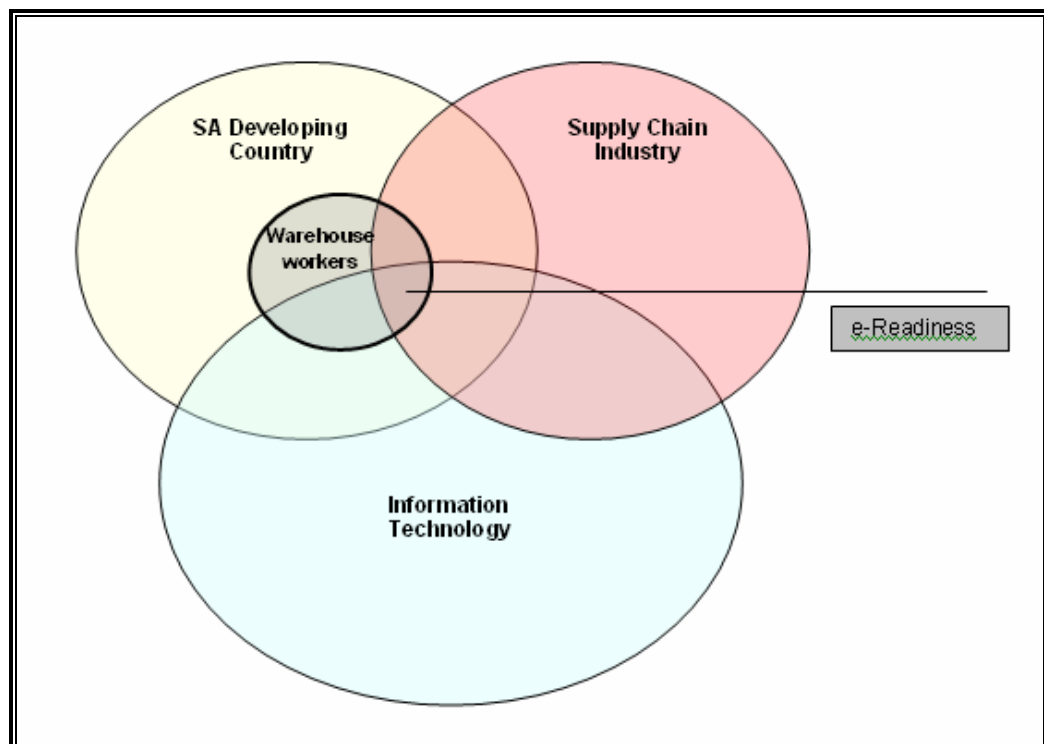


Figure 2.4 The e-Readiness of the warehouse worker in context

From the above, it can be argued that no innovation, plan, or project to address the digital gap can be really successful if the problem is addressed from the top, or from a distance. Jonassen (1994) has hinted that the designing tools should be taken away from the designers and given to the learners, reasoning that such a constructivist approach may result in a more substantive learning curve.

2.6 e-Learning demands on organisations and employees

The main objective of e-learning in the corporate environment is to train aspects of the business processes. The business goals of the company should be clear and supported by the various business areas (Kaplan & Norton, 1998). All training should be aimed to support the business goals of the company, whether it is e-learning or any other strategy (Cook & Heacock, 2003; Gill, 2003; Kaplan & Norton, 1998). Organisations use e-learning in two ways. First to measure performance, and secondly as a training tool (Cook & Heacock, 2003). For whatever reason the business may need e-learning, it demands changes from the organisation itself, the human resources including the learners for whom the training is intended. Organisations need to implement and provide the infrastructure, while instructional designers decide on the best strategy. The workers will then use their skills and competencies to complete the learning tasks. The process needs to be supported by the training facilitators and functional managers.

2.6.1 Demands on business goals

Performance tools measure the skills and competencies of the employees and assist managers in identifying the skills gaps or “competence information” (Drucker, 1998; Kaplan & Norton, 1998) to reveal the training that will be needed for the individual. It is important that strategic business goals on all levels are known, to define what employees need to learn to support the business objective (Kaplan & Norton, 1998). Strategies to determine the competencies and skills gaps can be supported by e-learning if the organisation has a culture to support e-learning (Gill, 2003). e-Learning offers a “wonderful addition to the arsenal of learning tools in the workplace” and, warns Gill, “...only if goals are clear and learning has been aligned with those goals, and if educationists and training facilitators provide a mix of learning opportunities to achieve those goals” (2003 p. 24).

Oberstein and Alleman (2003) agree that employee development can be one of the best investments made by an organisation. A new focus is needed for training. It needs to be integrated into the business strategy, and performances evaluated according to the effect they have on business indicators (Oberstein & Alleman, 2003). Manager guidance becomes very important to ensure success, to keep training relevant and to keep the learner motivated (Fidishun, 2000; Lieb, 1999). Table 2.4 is a short summary of the changes Oberstein and Alleman (2003) envisage in corporate training.

Table 2.4 **Becoming a learning organisation**

A shift needs to be made from here....	...To here
Training stand alone, and is not tied to other business domains	Training is integrated
Content driven	Driven by business strategy
Evaluation is based on ratings	Tied to business and performance measures
Centralized decision making	Decision-making is customer driven. Target audience shares decisions according to development needs and priorities

Training is responsible for organisational learning and development	Individuals at all levels are accountable for development
Classroom training	Anywhere, anytime, via alternative and innovative delivery methods
Training funded annually	Training funded by users who recognise its value and are happy with it

(Oberstein & Alleman, 2003)

Centralised, classroom training, conducted by one facilitator is being replaced by business-driven and shared learning. Learners need to be aware of what is needed for their business areas, realize their own shortfalls and manage their own training. The skills and competencies required for e-learning should be developed and promoted. Warehouse workers were subjected to centralized classroom-based, content driven training. To assume that e-learning can easily be the 'solution' because it has the capability to be available 'any time, anywhere' may be a costly mistake. e-Learning demands a much deeper analysis.

2.6.2 Technological demands on the organisation

e-Learning is dependent on access to the electronic infrastructure (Khan, 2005). Networks formed the backbone of communication in corporate companies for a long time. The internet and company intranets shifted the communication and access to information to a new level (Bowles, 2004 pp. 9-10). The World Wide Web (www) offers an easy accessible platform through which learners can gain access to a huge range of information. Learning can now be presented on the web with various forms of multimedia (Bowles, 2004). e-Learning requires that all learners have access to the necessary infrastructure to access instructions, content and be able to communicate with facilitators. e-Learning requires that e-learners have access to a computer, connected to the network and/or internet, with quick access to the learning information. (Figure 2.2) (Alessi & Trollip, 2001; Anderson & Elloumi, 2004; Bagnasco *et al.*, 2003; Khan, 2005; Nichols, 2003).

2.6.3 Software demands to manage the e-learning process

To provide in the demands of e-learning, the technological infrastructure should be able to promote at least three functions: production of multimedia learning material, management and delivery of the content, and the interaction between the various role players in the learning process (Trentin, 2003). Delivery and management refer to the facilitators while the interaction involves the learners, content and facilitators.

Learning management systems (LMS) are widely promoted to aid the training manager in delivering content, monitoring activities, communicating with the learners, reporting progress to the learner and to his/her manager, having training available whenever the learner is (Bowles, 2004; Trentin, 2003). Training facilitators are guided to generate content, store it in an online environment, arrange it into meaningful curriculums relating to the functional systems of the business environments, and make it accessible to all aspiring learners in the company (Bowles, 2004; Trentin, 2003).

LMSs are often credited to be the 'business solution' while little is written or said about each of these applications' unique features. Each of these systems has its own interface that needs to be learnt and mastered by the users before it becomes functional. Experienced computer users, for whom these are mostly intended, learn the dynamics of these systems within a short while. Learning is communication, and if a gap exists between sender and receiver, there is no communication. Warehouse workers, as intended receivers of information, should be able to relate to the LMS or method of delivery. Thus, not only is the computer literacy and access to infrastructure important for the warehouse worker, but also his/her readiness to understand and react to the prompts and instructions on an LMS. The warehouse worker needs to be able to use and interact with the technology to promote his own learning.

2.6.4 Demands on the learning process

e-Learning does not only refer to learning by means of technology, but includes the learning process too: "... encompass both the learning transaction and the technology used for producing and transmitting knowledge, with the emphasis on the latter" (Bowles, 2004 p. 16). The learning process needs to be the priority, and not the use of the technology, just because companies have invested in it. The main focus is still the transfer of knowledge.

Rosenberg (2001) stated: "...use of internet technologies to deliver a broad array of solutions that enhance knowledge and performance" (cf. Bowles, 2004 p. 16). This "array" of solutions suggests that the content should be presented in such a way that the learner takes charge, decides on a strategy, be motivated to start and finish, directs his own progress and tempo, is aware of the reasons and purposes of his training (Alessi & Trollip, 2001; Anderson & Elloumi, 2004; Khan, 2005). Adult learners need to take charge, and direct their own development (Atherton, 2005; Fidishun, 2000; Lieb, 1999). Fidishun (2000) recognized the fact that technology can not just be used blindly for all learners. Special attention should be given to those learners who are not used to take control of their own learning. Where learners have limited access and different levels of expertise with technology, the onus should be on the instructional designer to design a strategy to benefit these learners.

Online technologies promote interactivity and engagement. Learners and instructors have the ability to "meet" simultaneously, and regularly exchange information to discuss learning issues. Text-based online "chat" procedures are regularly employed in e-learning to communicate. Bowles (2004) and Trentin (2003) describe that the purpose of e-learning is to deliver content, and to enable the learner to study alone, or with co-learners. This is a paradigm shift for the warehouse worker as a learner. They got used to classroom training and had little options but to accept the way they were trained. This movement, or shift, from "industrian to information" has been devised by Reigeluth (1996) in an article to describe the new paradigm of instructional theory.

Table 2.5 Industrial age versus information age

Industrian Age	Information Age
Standardisation	Customisation
Centralised control	Autonomy with accountability
Adversarial relationships	Cooperative relationships
Autocratic decision making	Shared decision making
Compliance	Initiative
Conformity	Diversity
One-way communications	Networking
Compartmentalisation	Holism
Parts-oriented	Process-oriented
Teacher as "King"	Learner (customer) as "King"

(Reigeluth, 1996)

Reigeluth (1996) shows how the focus moved to the learner, who needs to take control of his own learning, participate in the decision-making processes and above all, take responsibility for his/her learning plan. e-Learning approaches require the learners to be responsible, able to make decisions, communicate to generate solutions and make recommendations. For the warehouse worker, who has been subjected to a traditional classroom approach, this is a very new concept.

Several skills and competencies can be identified from the probable approaches to e-learning. From the above it can be reasoned that good communication skills: typing, understanding the mail and "chat" facilities, have a good grasp of the interface where the content is presented, be motivated and know how to manage own learning, know how to access the content, and be in control of the technology and the learning process at all times.

2.6.5 e-Learning systems place a specific demand on managers and support staff

The e-learning strategy is complex and must be carefully planned before it is used as a learning solution (Trentin, 2003). Organisations often appoint one facilitator in corporate companies with the responsibility to manage all the training. Very few companies in South Africa has the luxury of an e-learning manager, instructional designer, author and facilitator (Adendorff, 2005). However, it is widely acknowledged that the quality of the instructional design is the ultimate deciding factor for learning success. Properly designed e-learning systems can determine learner needs and levels of expertise, to enable the learner to achieve the specified objectives (Anderson & Elloumi, 2004; Johnson & Aragon, 2001; Reeves, 1999). Anderson and Elloumi warn: "...the delivery medium is not the determining factor in the quality of learning: rather, the design of the course determines the effectiveness of the learning" (2004 p. 6).

Trentin (2003) listed several demands on support staff to ensure an effective e-learning environment. Among these demands are analysis of education needs, design, tutoring, mentoring, knowledge and competency of students, knowledge and competency of the organisation to support the learning and several others. The demands on the support staff was not the main purpose of this research, but what was important is that the facilitator, support staff and/or managers have a good understanding of the needs of the learners. From the learners' perspective, it is important that an open and understanding

relationship exist between facilitator and learner. The reason being that when the learner needs assistance, he/she knows how to and whom to contact for guidance (Adendorff, 2005; Khan, 2005).

2.6.6 Demands on the learner

Sheila Paxton, executive vice president and president of the Frontline Technology Centre, claimed that many e-learning initiatives fail because companies fail to prepare their employees to become self-directed learners. If no reason or motivation exists to become involved in online training, it will be doomed for failure (Business Wire, 2001). One of the most important factors for e-learning is motivation (Alessi & Trollip, 2001; Anderson & Elloumi, 2004; Johnson & Aragon, 2001; Khan, 2005; Nichols, 2003; Reeves, 1999). Motivation can provide the important direction and drive to get involved and stay focused. Paxton identified seven factors that need to be in place if companies plan to implement e-learning. Among these are the motivational issues, guidance and supervision, access to infrastructure (Business Wire, 2001).

Unsuccessful e-learning is related to weakly designed courses, strategies not aimed to accommodate the different learning styles, and a general failure to understand how to teach with technology. Adult learners learn differently and instructional designers should acknowledge the fact that adults are usually experienced in their fields, take interest in what and how they are to be trained and participate in the design and implementation of their training. Adults prefer to be consulted before being trained, and expect feedback when they ask for it (Dunn, 2000). Knowles, Holton and Swanson (1998) agreed that adults “resent situations where they feel others are imposing their wills upon them” (cf. Fidishun, 2000). They argued that the previous schooling of learners made them dependent. Authors like Ntuli (2002) blamed a dominant Western culture and stated that the Africans were forced to become submissive. Learner behaviour is regarded to be the responsibility of the educator “to move adult students away from their old habits and into new patterns of learning where they become self directed, taking responsibility for their own learning and the direction it takes” (Fidishun, 2000). Fidishun warned that some learners would not want to learn outside the classroom and may experience negative emotions to direct their own learning. Specific attention should be given to these learners by giving them short, directed, online tasks to gradually prepare them for e-learning (Alessi & Trollip, 2001; Anderson & Elloumi, 2004; Fidishun, 2000).

Llorens *et al* (2002) proposed that specific competencies have to be present to realise the successful facilitation of Computer Assisted Training (CAT). According to these authors, the main complex competencies and learning skills for CAT are:

- adaptability to change
- creativity and innovation
- empathy
- identification of opportunities in the given context
- effective management of time and aims
- potential for teamwork
- high self-esteem
- mental flexibility (Llorens *et al.*, 2002 p. 208).

In addition, Powell (2000) described the typical receptive learner to be self-disciplined, independent and responsible. Alessi and Trollip (2001) believed that the skill and ability to formulate mental models is a crucial component of learning “complex skills and phenomena” (p. 28) and especially the ability to be aware of what you know and do not know (meta-cognition).

The warehouse workers are adults and that would mean that planning to train them should include all the principles that apply for adult learning. An aspect, which may be a complex one, is the fact that, as members of a developing community, they may not have the confidence to question the strategies imposed upon them, and to concur with Ntuli (2002), their prior experience may have left them to be submissive. It does not mean that they do not have to take responsibility for their own learning, it emphasises the need to understand the target group before courses are designed. The demands on these learners may be more complex or maybe less known than generally believed to be.

2.6.7 Selecting an e-learning approach

The selection of the e-learn model is dependent on the needs analysis, and the instructional design can only be determined once the needs analysis has been completed (Alessi & Trollip, 2001; Anderson & Elloumi, 2004; Johnson & Aragon, 2001; Khan, 2005; Nichols, 2003; Reeves, 1999) “... the adoption and rooting of e-learning practices also depends on the final users’ awareness of the different methods using ICT as support for the learning processes” (Trentin p. 41). Meaning that the strategy that is going to be implemented for warehouse workers can only be successful if they are aware of their choices and options and have the skill and competency to put the delivered information to good use. Some demands placed on the learners are their competency to manage their own time to make good use of e-learning’s just in time, anywhere anytime-advantage completed (Alessi & Trollip, 2001; Anderson & Elloumi, 2004; Johnson & Aragon, 2001; Khan, 2005; Nichols, 2003; Reeves, 1999). There is pressure on the learner to know and be familiar with the relevant technologies and related services to ensure that the content can be accessed and opened. The learner also has to be able to find the information and make good progress with e-learning. The needs analysis include a goal analysis to learn what the learner will be confronted with (Alessi & Trollip, 2001; Anderson & Elloumi, 2004; Johnson & Aragon, 2001; Khan, 2005; Mager, 1991; Nichols, 2003; Reeves, 1999). Only then can an accurate assessment of learner readiness be determined. The warehouse workers work in an environment where procedures are physical but driven by technology. They need to perform actions that are controlled by computers. When e-learning is implemented, the dependency on technology will heighten. Instructional designers need to understand the demands e-learning will have on the workers to ensure that e-learning is functional and serves its purpose.

Instructional designers need to be educated and capable to select the correct approach. Educational and learning programs can be designed and presented through technology-based instruction to promote and develop cognitive thinking and own learning styles, and explored in order to meet the objectives. Alessi and Trollip (2001) believed that although people learn mostly spontaneously by

means of constructivism, there is a place for objectivism too – referring to tutorials and drill applications. Keller (1988) indicated that confidence is one of the most fundamental principles of motivation, and if a drill or tutorial generates confidence, it can form a solid foundation from which the learner can experiment. This is supported by Anderson and Elloumi (2004) who argue that learners should be confronted with a variety of activities to achieve a lesson outcome and to accommodate individual differences and learning/working styles.

Training facilitators need to be capable to develop a strategy that suits the needs of the learners (Adendorff, 2005). Although the required warehouse procedures that workers perform are simple, the educational challenge is huge.

2.6.8 New skills needed

Learners need to be transformed from instructive learners to constructive learners. Macpherson, Homan and Wilkinson (2005) are concerned that the overwhelming support and acceptance of e-learning prevents discussions of the soundness and impact on quality of learning material, computer technology and learner related issues, especially in the corporate environment. Specific concerns are expressed regarding the skills learners may or may not have for self-directed learning, anxiety experienced by new users, working alone, motivational issues and evaluation (Macpherson *et al.*, 2005). A clear message is sent out that specific skills, attitudes, perceptions, study and learning habits, intrinsic motivation, communication skills, and many other more personal, technical and ethical abilities are required from the e-learner (Bork, 2001). Any plan or project that has e-learning in mind should consider the readiness of their target group thoroughly before investing any time and money.

2.6.9 Time to change the strategy

Irving (2000) discusses the evolution of education from a student-lecturer system to a multi-tiered, technologically-based system where teachers are guided to develop and design lessons that are “inquiry-based”. Skills are mastered with time, and the more technology is used, the more constructivist the learning strategy becomes. Becker and Ravitz (2002) confirmed that increased computer use leads to increased constructivist practice (cf. Irving, 2000)

Educators often strive to promote and find strategies to develop higher-order thinking skills. This refers to the ability to disassemble information, arrange it into meaningful units of information, and assemble it again to present the learner with a further perspective of the initial problem. The last, and highest, skill to be achieved according to Bloom (1956) would be the ability to reflect, evaluate, and rate the new acquired information (Irving, 2000). Meta-cognition refers to the ability to be aware of one's own limitations and attributes, the competency to reflect on what has been done and where it will lead to, and lastly, the ability to self-assess whether or not the result was successful (Alessi & Trollip, 2001).

The learner must be ready to learn from several types of technological learning strategies that have been developed within the available infrastructure. The design of the learning solution must comply with the available infrastructure. Again it emphasises an adept, expert educationist and instructional designer who take the trouble to invest in a thorough target group analysis, to find out how ready the warehouse worker is for e-learning (Bowles, 2004). To determine the warehouse workers' skill and ability to adapt to:

- “learning transacted by way of digital technologies” ((Bowles, 2004 p. 19)
- collaborated learning or to seek support by communicating online
- synchronous or asynchronous learning
- self paced and self motivated learning
- combinations of online and offline instructions (blended approaches)
- a habit to motivate the self
- the discipline to learn alone
- work on computers, and
- get instructions form online communication.

Simultaneously, the organisation needs to:

- provide access and infrastructure
- provide relevant and clear objectives
- support and guide the learners to achieve clear objectives
- guide learners through communication
- accept that workplace and environment is one, and
- share in the responsibility of training.

These are some of the aspects that need to be present in a successful e-learning environment. There are specific demands on the learner and specific support and infrastructure demands on the organisation. When e-learning is planned for warehouse workers, a target group analysis should reveal whether the learners are prepared or “e-ready” for such a learning strategy. I have consulted several existing e-readiness assessments to explore what have been reported, how it was conducted and what aspects were considered to be the most prominent.

2.7 e-Maturity and e-Readiness

Before any attempt is made to incorporate e-learning in the corporate environment, a thorough assessment of the readiness of the learners should be undertaken (Strayer, 2003). The uniqueness of e-learning as an alternative training and learning strategy is acknowledged by the different approaches learners should take to participate. Among others the capacity to study in isolation, be skilled in the use of technology, interact indirectly and particularly, they need to be able to depend on their own abilities to motivate themselves (Johnson & Aragon, 2001; Macpherson *et al.*, 2005). The question is asked as to whether the “average worker has the qualities to engage and benefit from e-learning” (Macpherson *et al.*, 2005 p. 22).

Ifinedo describes the concept e-readiness “to define how nations across the globe fare in terms of creating, diffusing, adopting and using the various components of a networked economy” (2005 p. 3). Khan positions the e-Readiness in his institutional dimension where financial, technical infrastructure, cultural and content readiness of the institution should be assessed before

implementation (Khan, 2005). The Bridge Organisation (2001) analysed several organisations' perspective of e-readiness and the assessment tools to define e-readiness. e-Readiness assessment tools have been developed by the Centre for Development at Harvard University (CID), Computer Systems Policy Project (CSPP Readiness Guide), the Asian Pacific Economic Cooperation (APEC), Electronic Commerce Steering Group, and McConnell International (Bridges Organization, 2001; Ifinedo, 2005). This study explores a communities' e-readiness, which makes CSPPs definition of an e-ready community appropriate:

An e-ready community has high speed access in a competitive market; with access and application to ICT in schools, government offices, businesses, healthcare facilities and homes; user privacy and online security; and government policies which are favourable to promoting connectedness and use of the Network .

The ability of an organisation, school, community or even nation to utilise the computer technology to its fullest potential is described by the British Educational Communications and Technology Agency (Becta) as "ICT Maturity" (Becta, 2005). This maturity includes the computer support to improve processes, products and delivery of quality services. Organisations have a common concern about their sustainability, reliability and profits, and strive to improve constantly. They are also aware that changes, even small, cumulative changes can lead to a "qualitative change in how the organisation operates" (Becta, 2005). Five levels of e-maturity are identified to ensure the optimised level of computer technology:

- *localised use* on the level of the individual
- *internal co-ordination* to ensure that management of computer learning is in accordance with the organisation plan
- *process redesign* to apply new technology in existing processes
- *network redesign and embedding* to ensure that new technologies become part of the everyday processes
- *redefinition and innovative use* where new technology offer new learning services in new ways to learners (Becta, 2005).

The e-maturity of an organisation can therefore be seen as the ease with which it deploys the technology in the areas that may benefit from it. Booz, Allen and Hamilton (2002) described an e-mature business to be an organisation that encourages IT skills, have trust in the internet, are comfortable with cost, aware of the benefits and uses access to computer technology to its fullest potential. The potential readiness of warehouse workers may be a result of the e-maturity of the organisation.

Choucri, Maugis, Madnick and Siegel defined e-readiness in terms of access that may lead to opportunities if the learners have the capability to utilise the strategies:

We define e-readiness' as the *ability* to *pursue* value creation *opportunities* facilitated by the use of the internet. Simple as this statement might seem, it does enable us to parse it into operational variables for purposes of analysis and measurement. Specifically, we seek to measure the *degree* of ability and the *capacity* to pursue, in the *context* of specific opportunities identified. Jointly, these three basic factors are the foundations of our conceptual framework and serve as anchors for attendant data analysis (Choucri *et al.*, 2003 p. 4).

The readiness of the warehouse workers will depend on how they use the "connectivity" to the company network, intranet, understand the online instructions and whether they have the skill to communicate by e-mail. e-Readiness of the organisations depend not only on the infrastructure and

skill of the learners, but also on the learners attitudes, anxieties and cultural influences (Macpherson *et al.*, 2005; Reeves, 1999).

Choucri *et al* (2003) sided against a “one size fits all” type of e-readiness assessment, and argued that a contextualised approach should be able to shed more light on the e-readiness of a community. The essence of their approach is to measure the “degree of the abilities” and the “capacity to pursue” opportunities by using technology within a specific context. e-Readiness can have different meanings in different conditions. The point of departure then would be “Who asks the questions, why are they asked and for what purposes?” (Choucri *et al.*, 2003 p. 5). Readiness may be used in totally different contexts and therefore if e-readiness is explored, it means that the purpose for this should first be well defined. Choucri *et al* (2003) added that earlier literature identified many variables relevant to e-readiness, but few identified the relevance to what, how and why.

A basic conceptual framework has been generated to illustrate the basic logic of e-readiness. It identifies the access to infrastructure, the necessary capacities for e-learning, and lastly the variables that may be the “final proof” of readiness (Choucri *et al.*, 2003).

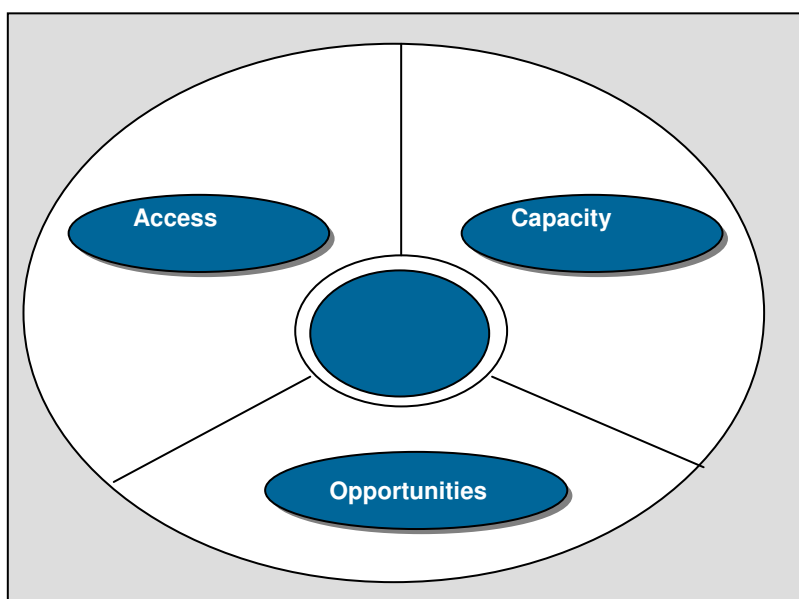


Figure 2.5 Domains of e-Readiness (Choucri *et al.*, 2003)

Figure 2.4 illustrates three domains of e-readiness: access, capacity and opportunities. Choucri *et al* (2003) posits that the readiness profiles of countries or communities depend on the “individual access and capacity conditions”. The differing variables and diversity of characteristics result in different opportunities and create a specific profile of readiness. “Profiles of readiness” are not fixed, but are dependent on socio-economic factors, experience, attitudes, individual differences and habits. Choucri *et al* (2003) defined sets of clusters to identify the factors that may influence the profiles of e-readiness.

Table 2.6 Readiness domains with clusters

Domain	Cluster
Access	Infrastructure Services
Capacity	Social factors Economic factors Policy factors
Opportunities	Opportunity penetration Specific applications

(Choucri *et al.*, 2003 p. 8)

Choucri *et al* hypothesize:

If *access* conditions are in place, then *capacity* considerations come into play. If both access and capacity are in place, then value creation *opportunities* can be pursued. In other words, there can be no viable *opportunity* creation in the absence of access and capacity conditions (Choucri *et al.*, 2003 p. 8).

This access, capacity and opportunity relate to the e-maturity of the organisation and may influence the employees' e-readiness. Access, infrastructure and skills were some of the attributes that were investigated in previous e-readiness assessments.

2.8 Previous e-readiness assessments

To guide me to explore the e-readiness of the warehouse workers, I consulted previous e-readiness assessments. Works from Piskurich (2003), Ifinedo (2005), Arif (2001), Macpherson (2005), University of Georgia (Board of Regents University of Georgia, 2003), Bridges.org (2001) and Huang, Huang Zhao and Huang (2004) have been used to assist me in identifying the aspects of e-Readiness. The first examples below refer to the e-readiness of a country and how the government has intervened to support and steer the general e-readiness of their nation, followed by an example where the e-readiness of specified nations in Africa are assessed. Then follows a discussion of a case study where the e-readiness of students in Cape Town were explored to decide on the viability of e-learning. To conclude the e-readiness of institutions I discuss Powell's (2000) e-readiness of an organisation.

2.8.1 e-Readiness of developing nations

Ifinedo (2005) argued that a belief among cynics is that Africa will never be able to cope in the information driven world. He presents evidence in the form of India who took it upon themselves to change:

India went from nowhere to where it is today by focusing on areas where it posses comparative advantages (see Nair and Prasad 2002). Similarly, other countries in East Asia have streamlined their national IT policies towards improving the lot of their citizens... seizing on opportunities wherever possible in the global economy (Ifinedo, 2005 p. 65).

Such a country is Malaysia. Since 1997 the government of Malaysia launched a national project to advance the country's national e-readiness, to be comparable with the developed countries of the world (Manecksha, 2001).

The Asia Pacific Economic Cooperation (APEC) Electronic Commerce Readiness Assessment Guide assessed countries' e-Readiness within and outside the Multimedia Super Corridor (MSC) referring to the countries that were operating on the technological superhighway, like Germany and the USA. They identified numerous parameters relating to e-readiness and divided it into six categories. These categories were "basic infrastructure and technology, access to necessary services, current level and type of use of the Internet, promotion and facilitation activities, skills and human resources and positioning for the digital economy" (Manecksha, 2001).

The Malaysian government then focused on education as one of the critical areas to promote the use of technology. Teachers were assessed regarding their IT skills, knowledge about IT and attitudes towards technology. Teacher attitudes were assessed according to software applications, and general IT skills; e.g. whether they felt confident or anxious, etc. (Luan *et al.*, 2001). Teachers were trained in the use of technology and how to influence their learners to become confident with the use of computers and the internet. In 2004, the e-readiness of policy makers within organisations, providers of e-learning, lecturers and facilitators of e-learning and learners were assessed. The learners in this case referred to students in tertiary institutions only. By this time, Malaysia was already established as one of the leading technological countries in Asia (Abas, 2004).

The value in this project is motivational. It indicates that a joint effort to establish a platform for e-learning, can be very beneficial. The identified categories of readiness are: access to infrastructure and technology, use of the Internet, motivational aspects to promote the use of technology, skills and support to enable the learners to use the technology. These categories can be utilised to assist in the assessment of e-readiness of warehouse workers.

2.8.2 e-Readiness of selected African states

Ifinedo (2005) conducted a report on nine African countries' e-readiness. The purpose of this assessment was to generate a rating for each country to enable them to compare themselves against other African states, and to rate themselves against the more technologically advanced countries in the world. Ifinedo used a diagnostic formula developed by Bui (2002) to measure the readiness of nine selected African countries. These nine countries were selected from each of the main regions on the continent, and included South Africa from the Southern African region.

Ifinedo's main input areas were defined as three basic building blocks: demand and supply forces and societal infrastructure. The building blocks included culture, knowledge, access to skills, and access to infrastructure; all of which were important for my research. These building blocks played a major

role in determining the countries' status as networked economies. Results indicated that South Africa fared the best and is rated to be the most e-ready country in Africa (Ifinedo, 2005).

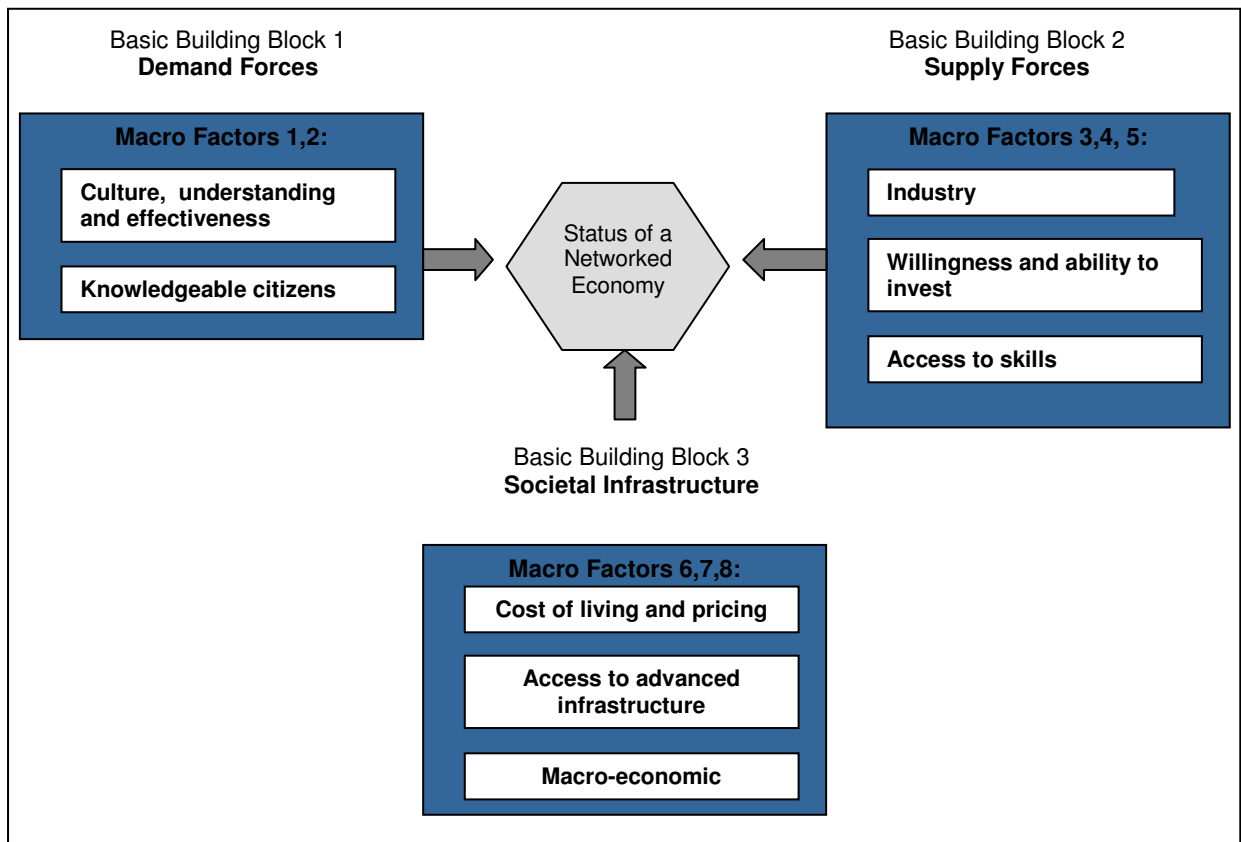


Figure 2.6 Building blocks of e-Readiness (Ifinedo, 2005)

The assessment consisted of fifty two indicators categorised under: culture, understanding and effectiveness, knowledgeable citizens, industry competitiveness, skilled workforce, investments, cost of living and pricing, advanced infrastructure and macro-economic environment (Ifinedo, 2005).

This research was conducted at a high level, and presented a holistic view of these countries' e-readiness. The importance for my study was that the cultural issues, e.g. language proficiency may be important to explore when researching the e-readiness of warehouse workers. Also the reference to "knowledgeable citizens" guided me to consider the learner's education levels to assess e-readiness of warehouse workers. Organisational support and provision of an infrastructure, along with a skilled workforce, are important aspects of e-learning. The last factor, "advanced infrastructure" is almost already answered for me in Ifinedo's research. South Africa is rated to be the most e-ready country in Africa, which is a good indicator that the organisations in South Africa are privileged to work in a world where connectivity is not a major problem anymore (Ifinedo, 2005). People in South Africa have telephones, mobile phones, do have access to PCs at work, to make them a "connected" environment.

However, the reality of the e-readiness assessment by Ifinedo, is that it does not reflect on the readiness of a specific group or community. It was conducted at a high level, and referred to South

Africa as a whole. Whether a learner attended a private school or a rural over-populated school, this report does not reflect the socio-economic differences of communities within a country. Countries differ on a national level, but individuals differ in culture, background, experience, social structures and frames of references (psychology.org, 1978; Reeves, 1999).

2.8.3 e-Readiness of Cape Town students

Arif (2001) considered the readiness levels of students at the University of Cape Town (UCT). Taking the background and history of the South Africa population into consideration, and accepting that more and more students in South Africa come from previously disadvantaged communities, the perceptions of the students regarding online learning were investigated.

The opportunity to learn by means of technology appealed to most of them, but they became aware of the difference, and even regarded it to be strange: "Learning from the screen is not a natural process" (Arif, 2001 p. 33). Responses regarding the use of technology were mostly positive, as most participants agreed that this strategy should be applied in most courses. But a concern was raised on the different types of support. They were not accustomed to being alone and without guidance. Arif argued that the difficulty in learning online resulted from the students' mixed levels of readiness, and lack of preparation. "...many students were struggling to understand the basics of computer technology, let alone dealing with the web environment..." (p. 37). Arif concluded by asking whether students were:

- prepared to use the computer technology?
- skilled enough to navigate and access content on the web?
- equipped for self-assessment and judgement in order to adapt to new directions in learning?
- ready for a change from old studying ways to new?" (Arif, 2001 p.37)

e-Readiness, a much needed condition, needs to be researched and investigated before any changes from the traditionally used learning strategies are considered (Arif, 2001; Macpherson *et al.*, 2005).

2.8.4 Organisational readiness as investigated by Powell

Powell (2000) queried organisations' readiness for web based training (WBT) to assess the preparedness of organisations before being lured into the technological attractions of online learning. He warned that e-learning may be a "disaster" if not carefully analysed before implemented in any organisation. Powell stated:

Training can be delivered using a multiplicity of media, such as the traditional classroom and computer-based training. Choosing Internet technologies to deliver training should occur only after careful consideration of a number of factors. These factors include what is taught, who is taught, where the teaching takes place, how the teaching is supported, and when the teaching takes place (Powell, 2000).

Powell insisted that organisations need to focus on the reasons of training, why it should be done, who are involved and how the instruction will be structured. A thorough needs analysis was seen to be critical before this learning strategy should be introduced (Alessi & Trollip, 2001; Anderson & Elloumi, 2004; Johnson & Aragon, 2001; Khan, 2005; Mager, 1991; Nichols, 2003; Powell, 2000; Reeves, 1999).

Table 2.7 Aspects of readiness

What is taught	Who is taught	How the teaching is supported	When does the teaching take place	Where the teaching takes place
Domain of learning	Culture of the organisation	Administration	Just-in-time	Technical infrastructure
Stability of content	Size of the organisation	Technical support	Anytime	
Importance of content consistency	Learner characteristics	Corporate support	Frequency	
Content complexity	Number of Learners	Union/labor support		
Media complexity	Geographic dispersion of learners	Developmental support		
Requirements for special equipment	Number of training sites			
Format of current materials	Consequence of time off the job			
Confidentiality	Preferences of learners			

(Powell, 2000)

Table 2.7 lists all components to be analysed, e.g. the what, who, where, when and how to indicate the considerations to be made before e-learning is implemented. My research focuses on the who, with the assumption that the SCM environments do have the infrastructure to provide in the technological requirements. The strategy and methodology can only be determined when the instructional designers know who they are dealing with. From Powell I learnt that the learner are subjected to the culture of the organisation, support and guidance from management, may have their own characteristics and learning preferences, and need to have time and a venue available for training. Learner characteristics include the ability to work and focus despite distractions. The e-learner needs to be a skilled reader, competent to use and learn from technology (Powell, 2000)

2.9 Assessing e-readiness

The previous section focused on examples where e-Readiness had been assessed and to learn from the literature how e-readiness has been assessed in specified environments. This section focuses on the tools and aspects of e-readiness that had been assessed and investigated to determine the e-readiness of possible target groups. It included studies conducted by Guglielmino and Guglielmino (2003), the University of Georgia's Student Online Readiness Tool (SORT) (Board of Regents University of Georgia, 2003), and the investigations of e-readiness by Huang, Huang, Zhao and Huang (Huang *et al.*, 2004).

2.9.1 e-Readiness of e-businesses

Huang et al. (2004) wrote that organisations may gain a competitive advantage if e-business is implemented, but that it holds an implementation risk if such organisations do not know their e-readiness for such a venture. These authors proposed three main dimensions to be assessed to determine the e-readiness of an organisation. They are:

- internal needs for e-business
- external environment
- IT diffusion and change management (Huang *et al.*, 2004 p. 368).

These three dimensions of e-readiness conform mostly to the demands of a business and not to a specific sector of the organisation, as with my study. What I found useful is Huang et al's summaries of dimensions of e-readiness as listed by other e-readiness assessments:

- the Asia-Pacific Economic Cooperation (APEC) listed six key domains of e-readiness: infrastructure and technology; access to services; level and type of use of the internet; promotion and facilitation activities; skills and human resources; and positioning of the digital economy
- the Harvard University's Centre for International Development (CID) developed an assessment model for regions or countries. This model identified the following main dimensions: Network access, network learning, networked society, networked economy and networked policy
- MIT developed a model for the diverse needs of e-business applications. Their model includes three main dimensions: access and infrastructure; capacity which includes social aspects, economic, regulatory and opportunity
- Cisco used a Net-ready model to assess the e-readiness of an organisation. Four main dimensions are identified: leadership, management, competence of the organisation and IT diffusion
- PriceWaterhouseCoopers' developed the e-business maturity model to assess organisations' readiness for e-business. The dimensions they used are: strategy; organisation and competencies; performance management; delivery and operations; value network processes; security and privacy; systems; technology; tax and legal.

From these assessments it was learnt that each of these methods made use of specified dimensions as key aspects to assess the readiness of organisations, regions or countries. The skill and capacities of the workforces are mentioned but not much is written about the readiness of a group of people within these organisations.

2.9.2 Student Online Readiness Tool

The Student Online Readiness Tool (SORT) is an online facility created by the University of Georgia USA. This readiness assessment tool is at the convenience of potential students to measure and assess their own readiness to study online (Board of Regents University of Georgia, 2003). The following key dimensions are listed for students to assess own readiness:

- Technology Experience: assesses mostly the confidence to work with the computer and related activities
- Access to Tools: Access to a PC, printer, internet, PC specifications, and networking to determine whether the student will be able to collaborate successfully during the studies
- Study Habits: Questions are asked to determine the student's study habits. Self discipline, time management and ability to meet deadlines are discussed
- Lifestyle: Does the lifestyle support studying. Does he/she have the necessary support?
- Goals and Purposes: Determining whether the student has the motivation to keep his studies relevant and to have the drive to keep on and finish
- Learning Experience: To make the student aware of his/her preferences, questions are asked on how he/she thinks.

Students are supposed to answer these questions online, to assess themselves. Only the first two topics can really serve as a valid online assessment tool, because study habits, lifestyle, goals and purposes and learning experiences can not really be assessed by means of a questionnaire. I do agree however, that they guide the student to reflect on his own habits, attitudes and learning preferences.

The value of SORT's readiness assessment is that it succeeds in covering several of the important aspects of readiness to be considered. I regard it to be on a high level, but if the learner's experience with technology, access to infrastructure, attitudes and lifestyles are known, it may be possible to make an assessment of the e-Readiness of that individual.

2.9.3 Guglielmino and Guglielmino on individual e-readiness

Individuals' e-readiness can be assessed by evaluating their technical experience and competency, i.e. the competency to work with computers and communicate successfully. These competencies should be supported by the capability to direct own learning, by means of the appropriate knowledge, attitudes, skills and habits (Guglielmino & Guglielmino, 2003). The learner's readiness levels may be supported by the readiness of the organisation, in the way management guides and supports learning processes. The learners' skill and aptitude to work with technology, together with the skills they display may be an indicator of their proficiency with technology. Guglielmino and Guglielmino (2003) emphasised the importance of learning style to assess whether the learner is adept in directing his own learning programme. Learning styles of warehouse workers may not be very easy to define, due to the fact that the warehouse workers have not been subjected to many other learning strategies other than classroom training (Hoppers, 2002; Ntuli, 2002).

The following section refers to a model designed by Reeves (1999) to serve as a guide to instructional designers when planning and developing training on the www. It does not refer directly to dimensions of e-readiness as the examples listed above, but due to the fact that I deal with a specific community and that their input will eventually determine the instruction, Reeves' model was critical for my study. Reeves identified three inputs that learners present when challenged with online learning. I regarded these inputs as the dimensions to be considered when individual e-readiness was explored.

2.9.4 Reeves' model to guide instructional designers for www learning

Whenever e-learning is planned, one of the most critical aspects to consider, is the needs analysis of the target group (Alessi & Trollip, 2001; Anderson & Elloumi, 2004; Choucri *et al.*, 2003; Kearsley, 2002; Khan, 2005; Mager, 1991; Reeves, 1999). Reeves (1999) developed a model to guide instructional designers when planning learning on the www. Although this is not a formal e-readiness tool, the inputs identified by Reeves have been identified to guide me in my study to explore the e-Readiness of warehouse workers.

Reeves warned that e-learning in the form of www learning, may fall in the “graveyard of previous technology innovations” if the needs of the training do not relate to the “unique offerings” of e-learning (Reeves, 1999). Needs analyses guide training managers and instructional designers to compare the needs of the target audience with the instructional solutions that are envisaged (Alessi & Trollip, 2001; Anderson & Elloumi, 2004; Gill, 2003; Khan, 2005; Mager, 1991; Reeves, 1997). Reeves defined the inputs, process factors that facilitators may use to support learning on the web, and lastly the goals.

The inputs as defined by Reeves are: aptitude and individual differences which refer to the competencies and skill of a learner with regard to task completion, learning, computer literacy, etc. The second input refers to the cultural habits of mind. I apply this principle to my research problem where the warehouse workers hail from different cultures and react to technology in different ways. The third input refers to the origin and strength of motivation. e-Learning implies that the learner should be motivated to learn on his/her own. Different types of motivation play a role to get the learner to participate in his own learning programme. Warehouse workers are subjected to different types of motivation by their environments and careers (Reeves, 1999). Figure 2.6 indicate the inputs needed to put the processes in motion.

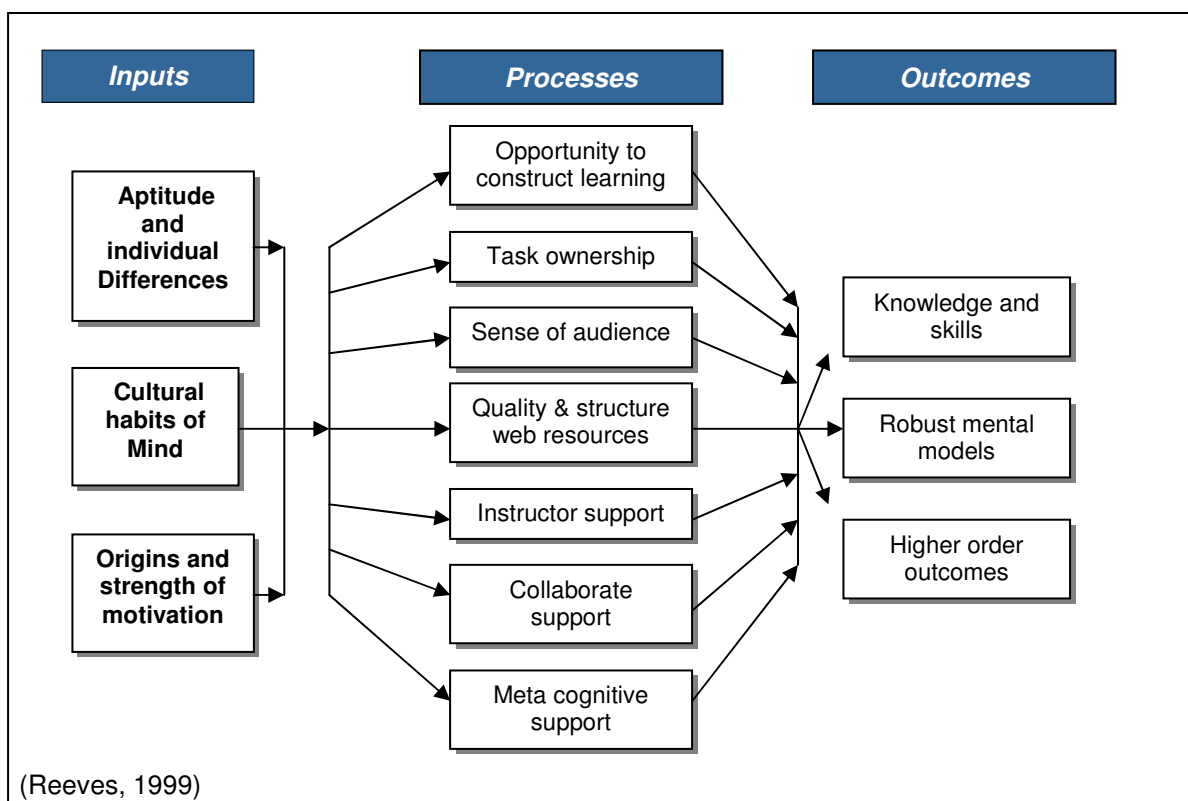


Figure 2.7 Model of WWW-based learning environment factors

Reeves’ model organises the readiness to be investigated from three readiness perspectives:

- Cultural habits of mind
- Aptitude and individual differences
- Origin of motivation (Reeves, 1999).

Culture is regarded as one of the most misunderstood influences of learning because what drives learning in some cultures does just the opposite in others. Although it has received more attention in

recent years, it is not nearly sufficient when e-learning is planned and designed (Reeves, 1999). Paxton (2001) also acknowledges that culture is essential in the acceptance of a self-driven learning initiative, because it is this social drive that may encourage, or discourage, learning. Any attempt to prepare learning in a technologically driven environment can only be successful when the multicultural settings of the learners are acknowledged (Khan, 2005; Reeves, 1999; Thomas & Inkson, 2004). Hofstede (1991) defined culture as “the collective programming of the mind which distinguishes the members of one group or category of people from another” (cf. Cullingford & Gunn, 2005 p. 54).

Facilitators should be aware of, and understand, cultural differences (Jones, 2005; Khan, 2005; Slay, 2002). Even aspects such as age, gender, ethnicity, individualism, income differences and social status should be carefully considered during a needs analysis so that a mismatch is avoided (Hancock *et al.*, 2005; Martin & Litton, 2001). According to McInerney (2004) socialisation can be added to the cultural influences as some cultures have an active, open and continuous social interaction with one another. Cultures that thrive on social support are now confronted with online learning, where isolation can so easily lead to dropouts and failures (McInerney & Roberts, 2004). Corporate cultures with their own beliefs, values and understandings complicate the matter further (Jaynes, 1997).

To move learners from a traditional classroom learning environment to an e-learning strategy, may be a challenging exercise (Khan, 2005). It is important to assess the learners’ preferences, because the change would require them to be psychologically, sociologically and environmentally ready. Khan regarded the acknowledgement of the different cultures as an ethical issue. Problems may arise when communication is attempted across cultures “when at least one of the parties trying to exchange information is unaware of, or chooses to disregard, a significant difference in expectations concerning the relationships between communicators” (Khan, 2005 p. 295).

Online learning designers have to consider all these cultural influences, and need to understand how the learner perceives the intended strategy from his/her own cultural point of view (Reeves, 1999).

Instructional designers will have to heed the warnings as listed by Thomas and Kerr when they say:

“Many of us fail in intercultural situations in all sorts of ways, such as:

- being unaware of the key features and biases of our own culture
- feeling threatened or uneasy when interacting with different cultures other than our own
- being unable to understand or explain the behaviour of different cultures
- being unable to transfer knowledge about one culture to another culture
- not recognizing when our own cultural orientation is influencing our behaviour
- being unable to adjust to living and working in another culture” (Thomas & Inkson, 2004 p. 11).

Ntuli, Hontoundji and Hoppers have indicated that the Western culture can be experienced to be threatening, especially from an African point of view. Technology and globalisation is not regarded as the “great enabler”, due to the threat it holds for Indigenous Knowledge Systems (IKS) and the indigenous cultures (Hoppers, 2002). Thomas and Inkson refer to “McDonaldization” (p. 12) to describe the fear of cultures of being assimilated by the United States at the expense of their own cultures. They regard the solution to be one of understanding and acknowledgment that cultures differ and that different views exist with regard to business and communication (Thomas & Inkson, 2004).

They concluded that the knowledge and recognition of culture culminate in an intelligence of cultures, namely “cultural intelligence or CQ” (p. 16). This CQ requires the manager of employees to have knowledge of culture, practice mindfulness and develop behavioural skills to be sensitive and knowledgeable when working across intercultural borders (Hoppers, 2002).

It is this CQ that Reeves calls upon when referring to “cultural habits of mind”. Instructional designers of e-learning should be sensitive, knowledgeable and skilled in their interaction with cultural differences.

Reeves defined aptitude as the “characteristics a student brings to a learning environment”. No two individuals learn the same way, therefore “the locus of control, learning styles, anxiety, tolerance for ambiguity, prior experiences, interests, attitudes and disabilities” (p. 4) need to be understood (Reeves, 1999). Constructivist pedagogy acknowledges individual differences and learning styles and adapts the training environments accordingly. Readiness, regarding the learner’s prior knowledge, aptitudes, motivations and other less visible characteristics, need to be considered. “In most educational contexts, we can not be guaranteed that learners will be homogeneous in terms of aptitudes, prerequisite knowledge, motivation, experience, learning styles, eye-hand coordination, etc” (Reeves, 1997 p. 10). Images and interactivity may appeal to some learners, whereas graphics and images might not be conducive to some learners’ learning success (Chang, 2003).

This is why the target group analysis should focus on characteristics like “age, educational level, cultural background, physical and learning disabilities, learner interests, experience, personal goals and attitudes, learning preferences, learning styles, motivation, reading and writing skills, computer skills, ability to work with diverse cultures, familiarity with differing instructional methods and previous experience with e-learning” (Khan, 2005 p. 184). Kolb (1984) identified perception and processing as important components that contribute to a learners’ experience (cf. Anderson & Elloumi, 2004). Perception refers to the way learners make sense of the information delivered to them, and processing refers to the way the information is understood and utilised. Learners differ from one person to the next. e-Learning can cater for individual differences and styles by determining the preferences of the learners first and then provide appropriate learning activities based on the identified preferences (Anderson & Elloumi, 2004). Individual differences include “patterns of thinking and reasoning about information, how individuals process information to make sense of the world, preferences for information processing, and how past skills or ability influence the learning process” (Johnson & Aragon, 2001). These differences place a huge demand on designing skills (Alessi & Trollip, 2001; Anderson & Elloumi, 2004; Gill, 2003). The target group needs to be analysed thoroughly to guide the design of the intended e-learning.

Whereas researchers such as Suanpang, Petocz and Kalceff (2004) investigated students' attitudes before and after being confronted with online learning, this study will investigate the readiness levels before even starting with learning. Reeves drew from Carrol (1963) where “aptitude” was the single

expected input to achieve academic results. Reeves extended the aptitude to “Aptitude and Individual Differences” to guide instructional designers for e-learning instruction. “The diversity of student [warehouse worker] in e-learning poses a challenge to the instructor” (Khan, 2005 p. 299). This positions my research on a pre-design stage, where the profile of the warehouse workers needs to be explored.

Motivation is regarded to be one of the most important aspects of learning. The intrinsic (originating from within the learner) and extrinsic (instructor- and performance-driven) motivation are important for learning. Learners should be motivated to learn (Anderson & Elloumi, 2004; Reeves, 1999). Will the mere use of technology motivate the learner enough to enable him/her to become more involved? Does the learner respond to interactivity, hypermedia, completed goals or satisfaction when a job has been completed? (Reeves, 1997; Reeves, 1999; Weber, Schoon, & Gonzales, 1999).

It is important that the learner should be clear on the goals he or she is pursuing. Do they receive ample guidance and motivation from their leaders? Is there a constructive reason for them to get involved in the training? (Kaplan & Norton, 1998; Khan, 2005). Bonk (2001, 2002) (cf. Khan, 2005) attributed the high attrition rate in e-learning to the lack of motivation. Keller (1983) proposed the ARCS (attention – relevance – confidence - satisfaction) model to guide instructional designers when designing and developing software or e-learning strategies (Alessi & Trollip, 2001; Anderson & Elloumi, 2004). Dennen (2001) listed ten key elements to motivate learners when busy with e-learning. For the purposes of my study, I have listed only the elements that I regard to be present when the e-readiness of a target group is explored:

- tone/climate to set the possible scene for the e-learning strategy. It includes the expectations of learner, business and facilitator
- meaningfulness, which makes the training effort relevant to the learner as well as the business objectives. The learner should feel that he can benefit from the experience
- choice, which will make the learner aware that he has the control to decide on the strategy and whether to be involved or not
- curiosity where the learner should be interested in the possible strategy. e-Learning has the advantage that the interaction with technology has already grasped the attention of the warehouse workers
- tension. Learners experience various levels of anxiety when being confronted with something that they have not experienced before, e.g. computer learning
- peer interaction. To establish the existing structures of support, to validate whether a learner will be able to get along without an instructor or facilitator as with classroom training
- goal-driven. Referring to the learner’s motivation to be involved and to be clear on what his contribution may be. This may lead to a feeling of accomplishment and achievement (cf. Khan, 2005 p. 200).

The warehouse workers share many attributes as a community that are subjected to the same organisational culture, are similarly motivated, but still respond in their unique individual ways to challenges. Reeves’ three inputs to guide instructional designers for www learning are important for my study for the purpose that it explains the ways a community or individuals may respond to the key dimensions of e-Readiness identified in the previous section.

The following section is a synthesis of the existing literature on e-readiness. The key dimensions or categories of the e-readiness assessments are discussed and grouped to guide this study in identifying my own theory codes of e-readiness.

2.10 Synthesis of e-Readiness

The research objective was to explore the e-Readiness of the warehouse workers. The first problem that came to mind was which aspects could be considered to indicate e-readiness of a community such as the warehouse workers. As South Africans, they are part of the developing world, and the effects of the digital divide ensure that most of the e-readiness dimensions are equally important to them.

I found it unfortunate that most of the listed e-readiness assessments (such as SORT, Harvard's CID, MIT and Cisco (§ 2.9.1) were described from a developed world perspective, even when it is stated that it is aimed at the developing world. It was taken for granted that prospective learners could determine their own e-readiness by accessing the internet, clicking on the right button, and by answering the pre-empted questions. None of the learners' anxieties or intrinsic fears, hopes, frustrations or preferences could be assessed in this manner. Developing communities may have more barriers to e-learning than only lack of access to hardware and networks.

I have selected the e-readiness assessment SORT (Board of Regents University of Georgia, 2003), to structure this synthesis of e-readiness dimensions. SORT is a web-based assessment battery that aims to assist potential students to reflect on their own ability to study online. It is one of few e-readiness tools that assess the e-readiness of individuals, therefore my decision to use it as the main structure to synthesize my theory codes (categories) of e-readiness. Characteristics like learning habits and motivation are addressed, while aspects like experience with technology and learning experiences imply a focus on the individual, which I intended to explore.

I have compared key dimensions of the discussed e-readiness assessments above with the dimensions listed by SORT to explore the possible theory codes that may contribute to determine the e-readiness of warehouse workers.

2.10.1 Experience with technology

Experience can only grow and develop when the learner is involved with and uses the technology. Access to technology is seen to be an important attribute to be ready for e-learning, but what if the learner does not have constant access, but is exposed to technology so that he does not experience the typical anxiety and fear of technology that is so often attributed to new users? This specific dimension as listed by SORT has prompted me to use this tool as a guideline. Experience does not necessarily address the financial constraints and the privilege of having access to technology. To me,

experience includes the fact that exposure to technology may have accumulated in other forms than the mere link to a network or web. The literature consulted refers to experience either directly, or implies it by stating that a knowledge of technology has to be present to be ready. Table 2.8 lists the key elements, which implies experience, as raised by these authors.

Table 2.8 Experience with technology

Experience with Technology	
Elements of e-Readiness	Author
Anxiety Fear for the computer Prior experiences Locus of control Interests in the computer and the use thereof	Reeves (1999)
Prior experience	Merrill (2002a)
Technical experience Technical knowledge Technical attitude Technical skill Technical habits	Guglielmino and Guglielmino (2003)
Confidence to use keyboard and mouse Confidence to browse internet/intranet Confidence to solve and do troubleshooting Confidence to use e-mail	SORT (Board of Regents University of Georgia, 2003)
Employees knowledge of IT Capability Acceptance and usage of IT	e-business assessment (Huang <i>et al.</i> , 2004)
Capacity	MIT (Huang <i>et al.</i> , 2004)
Capacity	Choucri, Maugis, Madnick & Siegel (2003)
IT usage	Cisco Net-ready (Huang <i>et al.</i> , 2004)
Knowledgeable citizens Skilled workforce	Ifinedo (2005)
Mixed levels of readiness	Arif (2001)

Reeves (1999) does not refer directly to technical experience when he advises web instructional designers, but implies that individual differences, habits and attitudes play a role when e-learning is planned. He includes elements like anxiety, fear for the computer (my own understanding is that it can also be from lack of experience), locus of control and interests and use of the computer. I interpret these as experience that may influence the readiness of a learner. Ifinedo (2005) mentions “knowledgeable citizens” as an important building block to ensure e-readiness. “Knowledgeable” implies a much deeper wisdom than mere “knowledge of” something, I therefore place this in the experience category. Piskurich (2003) mentions the attributes of competency explicitly with technical knowledge, attitude, skill and habits. Lastly the University of Georgia (Board of Regents University of Georgia, 2003) recognised that any aspiring student wishing to enrol for an online course, needs to be technically competent, which will ensure confidence. Merrill emphasizes that prior knowledge is an important principle of instruction.

Others like Guglielmino and Guglielmino (2003) agree about the experience with IT as a prerequisite for e-readiness, while Huang et al believe that knowledge of IT will lead to the needed experience. MIT and Choucri et al use “capacity” to describe the potential to address learning with technology. Ifinedo rated the African countries’ readiness by indicating the importance of knowledge and a skilled

workforce to be ready of e-learning. Arif, who studied online learning with Cape Town students, declared that mixed levels of knowledge with regard to technology exist, but that this knowledge was important for learning purposes.

Therefore, the first theory code on my list would be experience of technology. Learners gain IT experience through different processes. Whether it is referred to as “capacity” or “acceptance and usage of IT”, is not important, it is the confidence and awareness that grows from the exposure that may position a learner to be receptive for training with technology.

2.10.2 Access to technology

Access or connectivity is described to be the main artery of IT. Access includes connection to an available computer, relevant software (at the least), a network, intra/internet, network servers, and multimedia. Experience can only grow and develop when users have access to a network or a computer to work on. If the physical infrastructure is lacking or limited, it will definitely influence the readiness of any group, regardless whether they are part of a developing world or not. This is why I have listed Reeves’ input “Origins of motivation” under this heading as well, because the access and connectivity is a motivator in itself. Ifinedo (2005) identified a second building block, namely the societal infrastructure, which includes access to advanced technology by means of telephones, cell-phones and computers per 100 people. Paxton identified the importance of logistics, infrastructure and the physical environment to prepare learners (Business Wire, 2001). Piskurich (2003) listed the importance of infrastructure, support and structures. The Student Online Readiness Tool stresses the importance of connectivity, availability of multimedia and network connection for all aspiring students (Board of Regents University of Georgia, 2003). Table 2.9 lists the elements of readiness that can be categorised under access and infrastructure.

Table 2.9 Access to technology and infrastructure

Access to Technology / Infrastructure	
Elements of e-Readiness	Author
Origins of motivation	Reeves (1999)
Societal infrastructure: - Telephones per 100 people - Mobile (cell-) phones per 100 people - Computers per 100 people Internet providers per 100 people	Ifinedo (2005)
Logistics and infrastructure Physical environment	Paxton (Business Wire, 2001)
Access and technical support Support for the individual Transition structures in place	Guglielmino and Guglielmino (2003)
Consistent and convenient access to tools Connected to the inter/intranet Multimedia available on PC's Network connection	SORT (Board of Regents University of Georgia, 2003)
Technical infrastructure	Powell (2000)
Basic infrastructure and technology Access to necessary services	APEC (Huang <i>et al.</i> , 2004)
Network access	Harvard (Huang <i>et al.</i> , 2004)

Access to Technology / Infrastructure	
Elements of e-Readiness	Author
- information infrastructure - internet availability - network speed and quality	
Communication infrastructure	e-business assessment (Huang <i>et al.</i> , 2004)
Access and infrastructure	MIT (Huang <i>et al.</i> , 2004)
IT infrastructure and diffusion	Cisco Net –Ready (Huang <i>et al.</i> , 2004)
Value network processes, technology	PriceWaterhouseCoopers (Huang <i>et al.</i> , 2004)
Access is a prerequisite for capacity and opportunities	Choucri, Maugis, Madnick & Siegel (2003)

All the other sources list access and infrastructure to be an important dimension of e-readiness. Modern companies' strengths and capabilities are rated by their connectedness to other resources and role-players in the global network. While employing the infrastructure to compete and survive in the global world, the infrastructure can be put to good use and to the benefit of its employees. This is what PriceWaterhouseCoopers regard to be "Value network processes". Infrastructure and diffusion as stated by Cisco Net-Ready has the responsibility to use the communication network to its full potential due to solid and good communication infrastructures. This attribute introduces the value of good organisational or societal policies to ensure the procurement and implementation of sound technological policies.

All consulted reports and recommendations refer to a solid infrastructure and access of IT for training facilitators, managers and learners. From the literature I concluded that access to technology is a critical factor to be present if a community requires to be ready for e-learning.

2.10.3 Organisational contributions

The concept "worker" does not only refer to the status of an employee, but it also includes the dependency on a higher authority. Employees are dependent on the policies and culture of the specific organisation. How important is the role of the organisation to prepare or create "e-ready" learners? The employer is central in the status of the workers, for it is the business processes that mostly need to be learnt and mastered. The fundamental need for training is mostly business related. The business contributes to or constrains the readiness of the warehouse workers. The company can be seen as the basic motivator or initiator of training. Table 2.10 refers to the importance of the organisation as seen in the literature.

Table 2.10 Organisational contributions to e-Readiness

Organisation / Business Contribution	
Elements of e-Readiness	Author
Motivation as posted by the organisation	Reeves (1999)
Industry competitiveness - Provide access and infrastructure Skilled workforce - Provide training and support	Ifinedo (2005)

Organisation / Business Contribution	
Elements of e-Readiness	Author
Supervisory support Marketing and promotion Organisational culture	Paxton (Business Wire, 2001)
Support for the Individual: <ul style="list-style-type: none"> - Assessment of training needs - Transition structures built into learning designs - Variety of delivery options - Technical support - Funding Content support Organisational communication <ul style="list-style-type: none"> - manager & supervisor communication - newsletters & bulletin boards - website - training notices 	Guglielmino and Guglielmino (2003)
Goals and purposes <ul style="list-style-type: none"> - Clear goals and objectives Relevant objectives	SORT (Board of Regents University of Georgia, 2003)
Size of the organisation Technical support Corporate support Developmental support	Powell (2000)
Network society	Harvard (Huang <i>et al.</i> , 2004)
Adopting and diffusion of IT in the organisation	e-Business assessment (Huang <i>et al.</i> , 2004)
Leadership management Competence of the organisation	Cisco Net-Ready (Huang <i>et al.</i> , 2004)
Organisation and competencies	PriceWaterhouseCoopers (Huang <i>et al.</i> , 2004)

Reeves' (1999) referral to "origins of motivation" may include the contributions of the organisation to assist the employees to learn. The company holds the key to provide steps of development or to create the stepping stones that are needed to provide in the needs of the warehouse workers. A competitive and skilled workforce is needed to understand the role of the organisation. Paxton stated in the Business Wire (2001) that supervisory support, marketing and promotion is important to urge participants, and obviously the organisation culture which all play major roles in preparing the employees for learning. Piskurich's Quicklist (2003) refers directly to the importance of the organisation's role in assessments and establishing training needs, structures to be built into learning designs, variety of delivery options, technical and content support. Funding and financial support are also seen as a responsibility of the organisation. SORT encapsulates the business contributions by referring to the goals, purposes and specifying that relevance and clarity of goals are important. Other aspects like technical, development and corporate support provided by the organisation may assist learners to be receptive for growth and learning (Powell, 2000). Leadership and guidance by management can be one of the main driving forces behind the e-Readiness of a community (Huang *et al.*, 2004).

The warehouse workers, as employees are dependent on the company to provide direction, to guide, and prepare them for the future. This future is not only that of the organisation, but also that of the

worker. Organisation support and guidance was identified to be one of the aspects to be explored to determine the readiness of the warehouse workers.

2.10.4 Motivational aspects

Reeves' (1999) "origins of motivation" implies that there can be many motivators that arise from different circumstances with differing goals and objectives. Table 2.11 illustrate the motivators as obtained from the literature.

Table 2.11 **Origins of motivation**

Origins of Motivation	
Elements of e-Readiness	Author
Origins: - Extrinsic: job, salary, promotion, etc - Intrinsic: intellectual curiosity Intrinsic: motivated to control multimedia	Reeves (1999)
Intrinsic motivation	Ifinedo (2005)
Learner motivation Rewards and recognition	Paxton (Business Wire, 2001)
Level and type of recognition Financial support Assessments/diagnosis for learning needs Variety of delivery options	Guglielmino and Guglielmino (2003)
Goals and purposes - clear goals and objectives Relevant objectives	SORT (Board of Regents University of Georgia, 2003)
Promotion and facilitation of activities	APEC (Huang <i>et al.</i> , 2004)
Learner characteristics Corporate support	Powell (2000)
Availability of networks	Harvard (Huang <i>et al.</i> , 2004)
Effective motivation and incentive system	e-Business assessment (Huang <i>et al.</i> , 2004)
Performance management	PriceWaterhouseCoopers (Huang <i>et al.</i> , 2004)

The fact is that it is these motivators that may inspire an individual to take action and proceed to the next performance level. Differences in motivation may cause one person to be a self-driven learner while his neighbour may be negatively motivated. Paxton (2001) reports learner motivation and the importance of recognition to invoke more motivation, while Piskurich (2003) added the level and type of recognition to drive learners. Lack of computer skills can be a negative influence, while financial support can be seen as a motivator, while delivery strategies can motivate learners to move on. SORT (2003) again lists the importance of relevant, and achievable goals and objectives to motivate learners. Goals must be understood, or as described by Huang *et al.*: "effective motivation" to imply that learners know what are expected of them and have the inner drive to take responsibility for their destinies.

While an organisation and its infrastructure may grant access, it is only when the right motivators are in place, when progress to a next level is made. To get the warehouse worker to believe in, and to utilise the infrastructure, he needs motivation. This motivation may include clarity on learning

objectives, learning paths, methods and strategies to achieve the objectives and the possibility of accreditation. I needed to explore whether the existing motivators are such that the workers are ready for e-learning or not. My fourth identified theory code is motivation, or as described by Reeves “origins of motivation” (Reeves, 1999).

2.10.5 Life style, attitudes, habits and individual differences

If the infrastructures are created and organisational strategies allow it, do the warehouse workers have the learning discipline, the life style, the drive to learn on their own? This is arguably one of the most important aspects to ensure success for e-learning. Reeves (1999) listed “aptitude and individual differences” as one of the main factors to be analysed before web-based training (WBT) can be designed for e-learners. It refers to aspects such as interests, attitudes, learning style that influence the learner’s preparedness to negotiate online learning. The consulted literature indicates the importance of learner attitude to prepare an individual for e-learning. Piskurich’s Quicklist (2003) highlights the importance of self-directed learning readiness and habits to support the ability to learn by one self. SORT acknowledges the importance of learner motivation by questioning the study habits, life style, goals and purposes and learning preferences of the aspiring learner (Board of Regents University of Georgia, 2003). Table 2.12 lists these authors’ most important elements of e-readiness with regard to attitudes, habits and individual differences.

Table 2.12 Life style, attitudes, habits and individual differences

Life Style, Attitudes, Habits and Individual Differences	
Elements of e-Readiness	Author
Locus of control Learning style Anxiety Tolerance for ambiguity Prior experience Interests Attitudes Disabilities	Reeves (1999)
Learning styles Intrinsic motivation	Ifinedo (2005)
Learner motivation	Paxton (Business Wire, 2001)
Self-directed learning readiness <ul style="list-style-type: none"> - Knowledge to learn on own - Attitude regarding self-driven learning - Skill to learn on own Habits supporting self driven learning Variety of delivery options Learning styles	Guglielmino and Guglielmino (2003)
Study habits <ul style="list-style-type: none"> - Ability to read and understand material - Confident to express thoughts in writing - Not easily distracted - Monitor own progress, keep deadlines - Willing to interact with instructor and co-learners - Able to manage time effectively - Refrain from postponing tasks Life style	SORT (Board of Regents University of Georgia, 2003)

Life Style, Attitudes, Habits and Individual Differences	
Elements of e-Readiness	Author
<ul style="list-style-type: none"> - Assigned hours for study - Flexible and ability to adapt - Supporting friends and family Goals and purposes: <ul style="list-style-type: none"> - Clear objectives - Understand objectives - Understand relevance - Determined to finish Learning preferences <ul style="list-style-type: none"> - Explore rather than reading? - Read to confirm - Write memos? Alone or group?	
Learner characteristics Geographic dispersion Learner preferences	Powell (2000)
Capacity <ul style="list-style-type: none"> - social aspects - literacy - computer literacy - poverty index - economic aspects 	MIT (Huang <i>et al.</i> , 2004) /Choucri (Choucri <i>et al.</i> , 2003)
Employee knowledge of e-learning	e Business assessment (Huang <i>et al.</i> , 2004)
Learners respond differently Mixed levels of readiness	Arif (2001)

Guglielmino and Guglielmino (2003) developed the self-directed learning readiness assessment to assess learners' styles and attitudes regarding self driven learning. Learning style is regarded to be a critical motivator to enable a learner to accept training where he/she will have to draw on own resources to progress. An important aspect that may influence the attitude of the learner is knowledge of e-learning. It can be asked if the learner has ample knowledge of the technology or the strategy to warrant a valid opinion?

Warehouse workers have seldom been exposed to training strategies other than classroom training or on the job demonstrations. I asked the question whether it would be fair to judge their current attitudes if they did not know enough of the strategy? This was an aspect I decided to explore during the interviews. Attitude may be an indication of their readiness, but I realized that there may be too many variables to define their attitudes accurately. Regardless of this, I decided to use attitude as one of the main contributors, to get to a point where I may understand their attitude, and not really to explain it.

2.10.6 Cultural influences

Some cultures are intent on questioning, critique and some follow a more shared understanding of their environments. Hoppers (2002) described African learners to be submissive. Reeves (1999) advised instructional designers to be sensitive to these cultural preferences and diversity when designing learning for the web. Ifinedo (2005) identified culture as a demand force when the e-readiness of the African countries was measured. Paxton stressed the importance of the

organisational culture to prepare the employees for computer training (Business Wire, 2001). Piskurich (2003) hopes to see “evidence of organisational commitment to learning and to electronic delivery of learning”, which I interpret as the guidance employees expect to find from their employers.

The warehouse workers are a diverse, multicultural group of people. I accept and understand that each hail from their own individual cultures, and that these cultures may have a direct influence on their motivation and success, but for the benefit of this study, I will mainly concentrate on the business culture, with necessary references to the individual cultures where deemed necessary.

The organisation is the initiator of the learning culture. The business is the responsible entity to develop the habit and influence attitudes on learning. Time for learning has to be provided by the company, therefore I regard it as a part of the organisation’s culture. When learners refer to the lack of or availability of time for training, it becomes the organisation’s culture. Table 2.13 lists the cultural aspects of readiness as seen by these authors.

Table 2.13 Cultural aspects to consider for e-Readiness

Cultural elements of importance to e-Readiness	
Elements of e-Readiness	Author
Habits problem solving critique shared understanding diversity multiculturalism Sensitivity	Reeves (1999)
Culture understanding Adult literacy rate Secondary school enrolment Tertiary enrolment Achievement in science Education in business schools Flexibility to adapt to challenges	Ifinedo (2005)
Organisational culture Rewards and Recognition	Paxton (Business Wire, 2001)
Learning style Habits Knowledge of self-directed learning	Guglielmino & Guglielmino (2003)
Habits and lifestyle	SORT (Board of Regents University of Georgia, 2003)
Type of use of the internet	APEC (Huang <i>et al.</i> , 2004)
Culture of the organisation Corporate support When training takes place (time) Learner characteristics	Powell (2000)
Capability and intention of businesses to accept and use IT Effective motivation and incentive system	e-Business assessment (Huang <i>et al.</i> , 2004)
Leadership Management	Cisco Net-Ready (Huang <i>et al.</i> , 2004)
Submissive learners	Hoppers (2002)
Opportunity to plan own learning	Hsu & Shiue (2005)

Hsu and Shiue (2005) argue that distance learning should appeal and attract the attention of learners, and that they should get the opportunity to be involved in the planning of their own development.

2.11 Theory codes of e-readiness for warehouse workers

The literature supports the premise that e-readiness is based on the relation of the learner to:

- have access and are connected to an IT infrastructure
- have experience of technology
- utilise the platform provided by the organisation
- be motivated to become a self-driven learner
- exercise learning styles and attitudes to take responsibility of training
- experience a culture of learning and support.

These indicators are explicitly or implicitly mentioned in most of the e-readiness assessments I have consulted. My intention was to explore the warehouse workers' e-readiness from an interpretive view, and to report on their positions regarding each of these categories. I have opted to refer to them as theory codes of e-readiness, that still need to be confirmed in my exploratory study of e-readiness of the warehouse workers.

2.12 Research question

When I initially started this research, I realized that I needed to understand my target group in several ways. I need to find a way how to make them perceptive to e-learning, to make the training work for them. I have now looked at what e-learning is in the form of models and how a globalised world has influenced businesses to become world players. The warehouse workers have not escaped the effects of the digital divide, and find themselves caught in an environment where technology commands the success of the organisation. They fulfill a major role in the success of the SCM industry, but have to rely on classroom training when they need to learn new systems and procedures required for the business.

e-Learning is hailed to be a solution to employees who can not leave their working areas due to the “anywhere anytime” – advantage of e-learning (Bowles, 2004). My research question is:

How ready are warehouse workers for e-learning?

Choucri *et al* (2003) argued that e-readiness depended on access and capacity. If these fundamentals were present within a community, it may lead to opportunities and growth. Reeves' model (Reeves, 1999) identified three inputs that instructional designers should consider before designing or developing an e-learning solution. My sub-questions as point of departure:

- What individual elements with regard to attitude and habits may contribute to or constrain e-readiness?
- How do cultural habits of mind influence the e-readiness of warehouse workers?
- How do origins of motivation affect the e-readiness of the warehouse worker?

I chose to use this model as my main inspiration and to guide my research because it discerns that a condition exists before e-learning or for that matter, any learning is implemented. It reveals the fact that learners will react to learning stimuli in unique ways, have their own perceptions, fears, anxieties as influenced by their unique habits, attitudes and cultures. It further indicates the importance of motivation to become active in the learning process. To conclude, this model shows the e-learner in the e-ready position.

2.13 Conceptualizing the e-readiness of the warehouse worker

The concept of e-readiness relates to the presence of e-learning and the application of information technology to induce learning. e-Learning is a training strategy widely used in the educational, business and private sectors of developed communities world wide. When computer-based training is developed as a training solution, one of the assumptions is that the target group would be computer literate and able to understand most of the underpinning knowledge and skills needed to make CBT successful. It meant that the users had to be receptive for this medium, and able to express and demonstrate the skills and knowledge to make full use of this strategy.

Needs analyses have to include a thorough interpretation of the available infrastructure, the access the community has to technology, and the influence of culture on learning habits, attitudes and learning styles. Any learner can be introduced to e-learning, and it can probably be used as a strategy, but eventually his/her readiness levels are going to determine the success of the outcomes as detailed in Reeves' model. I have added a "readiness barometer" to Reeves' model to illustrate that different levels of readiness may exist per learner, as determined by his culture, individual habits, learning style and attributes, and origins of motivation. The motivations, aptitudes, attitudes and cultural influences differ from person to person, for some it may be strength, for others it may be a constraint. It concurs with the readiness "profile" suggested by Choucri et al (2003). It is my intention to explore these aspects that contribute to e-Readiness for warehouse workers. (Figure 2.7).

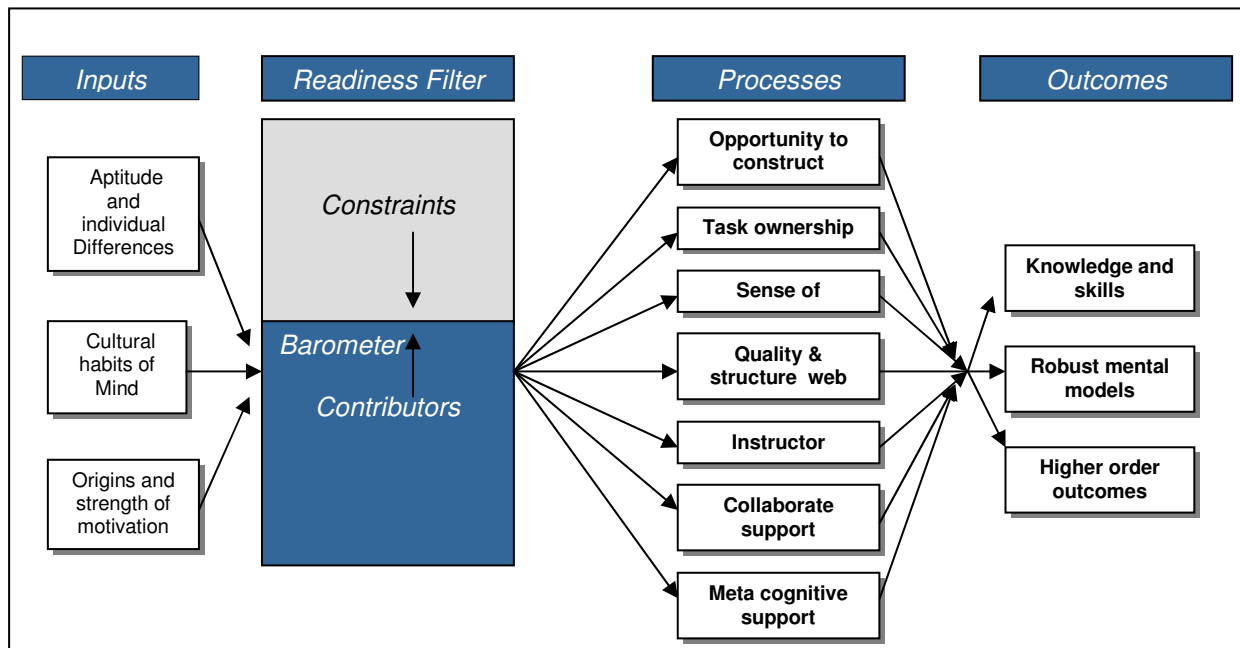


Figure 2.8 Readiness barometer as conceptual framework

The instructional designer needs to be aware of the most prominent contributors with regard to culture, aptitude and individual differences, and motivation. This exploratory study aimed to interpret the contributors and constraints of e-learning for warehouse workers. Simultaneously it may involve warehouse workers, as adult learners, in the planning and design of a learning plan. This exploratory study then is to understand the cultural barriers, catalysts, and individual differences that may influence e-learning.

2.14 Summary of Chapter 2

The corporate workforce needs to be prepared for technology, hence the urgent call that technology needs to be used to develop a skilled and knowledgeable workforce. Whether it is called e-learning, distance learning, virtual learning, web-based learning, or Internet learning, it still refers to the process where learners interact with the learning content, other learners, and the instructor through technology (Anderson & Elloumi, 2004; Bennet & Bennet, 2004). The objective is “how to learn”, rather than “what to learn” (Bagnasco *et al.*, 2003).

Ducasse (1958), described the purpose of education as “...[to] raise self to levels of greater and more secure happiness and beneficence” and agreed that it is possible for individuals to “take their education in their own hands” (Park, 1968 p.14). e-Learning can be the solution for the warehouse worker to raise their own education levels by partially taking responsibility for their own development (Bowles, 2004). However, due to the effects of globalisation and the resulting divide, a paradox exists because the same technology that is proposed as the solution seems to be the obstacle. The longer learners are ignored and marginalized with regard to computer technology, the more difficult it will become to introduce them to e-learning. e-Learning will put a premium on learning habits, aspirations, ability to self-motivate, and especially transform the learner from a passive to an active, self-motivated

learner. The learner needs to develop into an active constructor of knowledge and competence. In an online learning situation, he/she will be confronted with various stimuli with which to react.

Existing literature was consulted to identify key aspects of e-learning. Some documents assessed e-readiness on country level while few others assessed the e-readiness of organisations and regions. A synthesis of the key aspects of e-readiness resulted in the following theory codes of e-readiness of warehouse workers:

- access to an IT infrastructure
- experience of technology
- organisation support
- motivational aspects
- learning styles and attitude
- culture of learning and support.

To determine the e-readiness of a community is similar to a needs analysis of a target group. The challenge then becomes the responsibility of the instructional designer. Part of the needs analysis is to investigate the position of the learner, find out strengths and weaknesses, and the competencies that exist that could contribute to the e-learner's success, and which attributes are present that may hinder the development of e-learning. Therefore a thorough readiness investigation is needed to find the elements of readiness in the warehouse worker that may be conducive for e-learning. Reeves (1999) identified three input areas that are needed when learning on the www is planned: cultural habits, aptitude and individual differences, and origins of motivation. These three input areas will be used to categorise the investigation of warehouse workers' e-readiness. This research is planned as a qualitative investigation of the e-readiness of the South African warehouse worker. Only when the learner is understood from his/her own perspective and context can a strategy be designed to assist the warehouse worker to become a life-long, e-learner. The next chapter will explain the research methodology of this study.