

University of the Western Cape

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Towards a framework for the development of e-skills for digital inclusion in the Western Cape

A thesis submitted in fulfilment of the requirements for the Master's degree in

Information Management

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of the University of the Western Cape

by

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ABSTRACT

Digital inclusion, through the development of appropriate e-skills, is widely recognised as an essential means of capitalising on the opportunities presented by the information age for social and economic advancement. However, South Africa has not yet clarified its policy of digital inclusion. It has only just begun to tackle the challenge of developing an e-skilled society. As yet there is not an enabling e-skills framework and national implementation strategies are still at an early stage. The conceptual framework for the delivery of e-skills for digital inclusion specifically in the Western Cape of South Africa, which was developed as part of this study, could therefore make a substantial contribution to local research. Certain areas surveyed in this study have been overlooked, underestimated or have yet to be explored by local researchers, while existing research on related areas is generally fragmented and studied in isolation, despite the high interrelationship between the various areas. The conceptual framework that has been compiled offers a coherent holistic perspective, and depicts the logical flow from digital exclusion to inclusion in the Western Cape context. It identifies: (i) the groups most in need of focused inclusion efforts; (ii) significant barriers to inclusion; (iii) specific e-skill clusters for digital inclusion; (iv) guidelines for delivering these e-skills; and (v) the objectives of digital inclusion that the Western Cape should strive to attain.

Each of these research areas has been investigated in the context of an on-going provincial *e-skills for digital inclusion initiative*, focused on training (largely marginalised) community e-centre employees. The qualitative research used semi-structured interviews with ten recently trained individuals, as well as three programme facilitators. Overall, digital inclusion in the Western Cape is conceived as a gradual process, initially concerned with achieving relatively basic objectives such as enabling citizens to access information and increasing the use of ICT in the province. It is envisioned that these short-term outcomes will eventually translate into longer-term advantages for individuals as well as the larger society.

Having the appropriate knowledge and attitudes is as important for digital inclusion as having skills. Therefore the term 'digital competence' is preferable to 'e-skills'. The competence areas include combinations of technical and cognitive abilities, the latter

being more relevant to the broader inclusion impacts, yet more challenging to instil. These findings, which have been combined with strongly learner-centred guidelines, are presented in the conceptual 'Digital Competence for Digital Inclusion' framework. It is hoped that curriculum developers will give serious consideration to this framework and the recommendations contained in this study. It could form a useful basis for the development of digital inclusion throughout the country and e-skills related academic research.

Keywords: e-skills, digital competence, digital inclusion, e-skills delivery approach, barriers to digital inclusion, Western Cape, marginalised groups



DECLARATION

I declare that “**Towards a framework for the development of e-skills for digital inclusion in the Western Cape**” is my own work, that it has not been submitted before for any degree or examination in any other university, and that all the sources I have used or quoted have been indicated and acknowledged as complete references.

Carlynn Pokpas

Date



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CHAPTER 1: INTRODUCTION

1.1 Background

1.1.1 Digital inclusion and e-skills status quo

The relationship between information and communication technologies (ICT) and developmental goals has reached immeasurable proportions. Developed and developing countries alike have realised the essential role ICT plays in growth, competitiveness, socio-economic development and the progress towards knowledge-based societies. South Africa has by no means remained impervious to this global movement (Bilbao-Osorio, Dutta & Lanvin, 2014; Jansen, 2014; Presidential National Commission, n.d). There is an increasing awareness in South Africa that ICT should be used more widely, partly because of the country's position as seventieth of 148 countries on the World Economic Forum (WEF) 2014 Network Readiness Index, as well as its downward slide on the continental ICT connectivity rankings (Bilbao-Osorio et al., 2014; Gillwald, Moyo & Stork, 2012). Technological advancements have brought South Africans new opportunities in fields such as health, employment, citizen engagement and education. While many have benefitted, a large proportion of the population is not only excluded from advancement, but could become even more marginalised and have even lower socio-economic standing (Wessels, 2013). As Minister in the South African Presidency, Trevor Manuel stated, "The truth of the matter is that inequality will grow because ICT does not wait until the laggards are ready." (Jansen, 2014) The widening gap between the opportunities for those who are more advantaged and those who are less advantaged has resulted in global and national efforts to ensure the digital inclusion (DI) of marginalised groups.

It has proved difficult to identify and implement successful DI strategies, particularly in developing countries (Salman & Rahim, 2012). Until recently, the main goal has been to provide urgently needed access to infrastructure and ICT in underdeveloped regions. However, providing access to ICT to people without the necessary and appropriate skills to be able to use it has proved to be a largely ineffective means of inclusion (Department of Communication and the e-Skills Institute, 2010). This has

resulted in a shift towards developing “human skills infrastructure” (Cukier, Smarz & Grant, 2011, p. 1) frequently referred to as electronic skills (e-skills).

(E)-Skills are broader than ICT skills, and encompass... the ‘user skills’ which are indispensable to ensure that non-ICT sectors, as well as society as a whole, draws the full benefits from advances in the ICT sector, especially through productivity gains and better social integration. (Lanvin, 2008, p. 4)

These skills are viewed as so important that they are considered to be “the global currency of the 21st century” (OECD Week, 2012, p. 2). Meaningful application of these abilities is an essential ingredient in becoming self-reliant, prospering socially and economically and developing through new learning opportunities (Tapscott, 2012; Mitrovic, Sharif, Taylor & Wesso, 2011).

While technology may appear to be the focus of this field of discussion, the ultimate goal is development, equity and improved opportunities. The emphasis of e-skills is therefore not on creating a digital but an information and knowledge-based society (Carbo, 2013; Tapscott, 2012) “...where the production, management and consumption of information and knowledge are seen to now be at the core of economic productivity and societal development.” (Selwyn & Facer, 2007, p. 5)

Thus far, South Africa has made little progress towards its avowed intention of developing a skilled and knowledge-based society (Lotriet, Matthee & Alexander, 2010). It not only lags far behind first world countries, but is also being overtaken by other African nations – some of whom rate far lower in terms of developmental indicators (World Bank, 2014). The digital divide in South Africa is largely the legacy of the Apartheid era. It is the historically disadvantaged communities who sorely lack these essential skills. In its response to this serious need for e-skills training nationally, the “South African government has committed to a major effort on e-skills enhancement ... believing that well developed socio-economic e-skills have a crucial role to play in almost every facet of a sustainable future in South Africa...” (The Department of Communication and the e-Skills Institute, 2010, p.43) Concerted efforts have been made by the Government, in alignment with South Africa’s Medium Term Strategic Framework (MTSF): 2009—14, to implement a National e-Skills Plan of Action (NeSPA), amongst other initiatives by the Department of Communications.

One of the main focuses of the NeSPA is the establishment of collaborative e-Skills Knowledge Production and Coordination CoLabs across the country in association with higher education institutions, which have each been designated a central theme. The DI theme was assigned to the e-Skills CoLab of the Western Cape (WC) province. Its activities have included delivering appropriate e-skills for DI through the use of community e-centres situated across the province. The CoLab's main priority is "...to produce knowledge and coordinate innovation, existing and complex digital inclusion eSkills initiatives as part of a response to the South African National e-Skills Plan of Action; and aligned to the Medium Term Strategic Framework (MTSF)." (Stoltenkamp, Kabaka & Kies, 2013, p. 3484). This initiative, like that of every other South African effort towards providing e-skills for DI, is based on the premise that: "e-Skills are essential in empowering individuals so that they can participate fully as citizens of the Information Society, and take advantage of all the opportunities before them." (The Department of Communication and the e-Skills Institute, 2010, p. 70)

1.1.2 Empirical setting

With an area of 129,462.21 km² the WC of South Africa is home to over 6.1 million people (Statistics South Africa, 2014a). Although generally considered economically better off, "the province is still marred by high poverty rates, inequalities in the distribution of income between various population subgroups, and unemployment, although not to the same degree as other regions in South Africa" (PROVIDE, 2005, p. 1). The lingering effects of the Apartheid era are evident in continuous racial divisions and lower socio-economic status and living conditions of non-whites within the province (World Bank, 2014). This is a matter of concern given that over 80% of WC citizens are either 'Coloured' or 'Black'. Diversity is amplified in South Africa's recognition of eleven official languages, although only three of these are official languages in the WC – Afrikaans, English and isiXhosa (see Appendix E for statistics on race and language).

The WC faces a host of key developmental challenges. Education is one of these. Roughly only a quarter of adults had completed secondary school (grade 12), at the time of the 2011 census (Statistics South Africa, 2013a). This has far reaching implications, given the key role of education in employment, the economy and quality of life. South Africa as a whole faces huge unemployment levels, evident in the

national NEET figures, which indicate that one in three 15-24 year olds are currently not in employment, education or training (Statistics South Africa, 2014b). The national youth unemployment rate¹ is “the highest long-term youth unemployment rate among medium-income nations” (Africa, 2013). Equally concerning given the provincial demographics, is that ‘Coloured’ and ‘Black’ groups generally face much higher levels of unemployment than their ‘White’ counterparts (PROVIDE, 2005).

There is a definite divide in the developmental status of the WC province. On the one hand, the WC could be viewed as moving towards a very “advanced industrial economy”, but also “hosting elements of a transitional society” on the other (Groenewald, 2008, p. 22). Stated more baldly, it is simultaneously home to very affluent as well as poverty-stricken groups, and has one of the highest inequality levels in the world (World Bank, 2014). In addition to poverty and unemployment, it faces many other challenges nationally (PROVIDE, 2005; Western Cape Government, 2006). A major national health risk like HIV is less prevalent in the WC, but it is nevertheless rife and a cause for huge concern in the poorer underdeveloped provincial areas (Western Cape Government, 2006). The WC is also the fastest growing South African region, largely because of migration. While a great deal of the population resides in rural areas, there is a growing influx of citizens to urban locations (Groenewald, 2008; World Bank, 2014). This has led to huge increases in informal settlements (shacks) specifically in already densely populated areas like Cape Town (Groenewald, 2008). The rapid growth of these areas has increased the frustration level of residents as is evident in the number of (increasingly violent) protests mainly related to service delivery, low job prospects, housing and infrastructure, public health and political representation (Grant, 2014; World Bank, 2014). The concomitant rise of crime has fuelled public anger. While rape and gender-based violence are a national problem, substance abuse and gang-related incidents are especially rampant within the WC (Evans, 2013) – specifically in the Black and Coloured areas – and are closely related to high levels of youth unemployment and the socio-economic inequality so deeply interwoven with crime (Demombynesa & Özler, April, 2005).

¹“Youth unemployment refers to the share of the labour force ages 15-24 without work but available for and seeking employment” (World Bank, 2013).

The South African ICT landscape mirrors the developmental split of the WC region referred to above. In this region, there is a digital divide which is described as “uneven with some cities and regions developing rapidly whilst others are disconnected” (Wessels, 2013, p. 18). The groups who lack skills typically coincide with the poorer, marginalised communities who lack access to ICT. Cellular phones are the exception. It seems that these are ubiquitous across the range of socio-economic groups, despite mobile communication in South Africa being considerably more expensive than in other African countries (Calandro, Gillwald & Stork, 2012). However, cellular phones are used mainly for more traditional purposes (making phone calls) because of the limited access to the Internet through mobile technology in the WC (Statistics South Africa, 2011). Internet access varies greatly throughout the province, particularly between urban communities - where most people have Internet connections - and rural communities (Sithole et al., 2013). Given the global shift from mere provision of access to increased quality and speed of connectivity, these disadvantaged and largely unskilled groups are likely to fall even further behind.

1.2 Problem statement

“Existing research approaches have not been able to address the huge e-skills capacity building needs of South Africa.” (Ikamva National e-Skills Institute, 2014, p. 3). DI and e-skills frameworks and interpretations of many of the related concepts have understandably been described as “messy and blurry” (Peña-López, 2009, p. 32). The abstract nature of the term DI has resulted in a vast range of definitions and understandings, ranging from the most simple physical access and basic use of ICT, to the empowerment and full participation of an individual in the information and knowledge-based society. The problem is compounded when different understandings lead to different intentions and outcomes, leaving a cloudy haze around what exactly is to be achieved and for whom (Seale, 2009; The Economist Intelligence Unit, 2013). The ‘e-skills’ concept, which relies heavily on the adopted ‘DI’ definition and intention, has proved to be possibly even more confusing. The result is that debate arising from the lack of clarity continues to hinder the definition of the term and its specific skill components, and to delay the creation of a standardised framework (International ICT literacy panel, 2007; Merkofer & Murphy,

2009; Pretorius & Van Biljon, n.d; Virkus, 2011). While many feel that equipping citizens with basic computer skills is sufficient, others would argue that e-skills for DI entails critical thinking and a much broader range of capabilities.

Another problem is that developing countries have not yet been able to identify DI approaches that could effectively deliver these e-skills (Barclay & Duggan, 2008). Although replicating DI approaches of the world's "digital pacesetters" (gov3 limited, 2005, p. 3) may seem the obvious solution, careful comparison of the countries' social and economic contexts as well as e-readiness would have to be done before these strategies can be used (Adamali & Lanvin, 2005). As yet, most of the efforts made in developing countries to provide e-skills for DI are fragmented, fail to take account of 'best practice', and often pursue wasteful ways to 'reinvent the wheel'. These unfocused interventions lack a thoroughly researched, well documented evidence base (Alexander, Lotriet & Matthee, 2009), compromising comparability. The lack of attention focused on skills and ICT implementation initiatives in developing countries (Van Reijswoud, 2009) make it difficult to establish how current, relevant and contextually appropriate their overall DI objectives and skills initiatives would be to address the particular socio-economic needs of the WC of South Africa.

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In short, there are insufficient guidelines that would help to define an enabling and appropriate framework supportive of e-skills for DI initiatives in the WC. Such a framework should provide conceptual clarity on DI in the WC context, the required skills sets and relevant e-skilling approach guidelines. This study aims to provide recommendations that would aid the development of such a framework.

1.3 Research questions

In accordance with the identified research problem, the following research questions were adopted:

The main research question:

What are the e-skills for digital inclusion and what would be the most effective way to provide them in the Western Cape context?

Sub-questions:

1. *How is digital inclusion conceptually defined?*

- What definition or conceptualisation of digital inclusion do 'best practice' initiatives strive to support, as reported in the relevant literature?
- What definition or conceptualisation of digital inclusion does the WC CoLab strive to support and promote through its e-skills initiative?
- Who are the typically digitally excluded and what are the barriers to digital inclusion?

2. *What are the appropriate clusters of e-skills for digital inclusion?*

- What are the e-skills sets for digital inclusion described as 'best practice' in the relevant literature?
- What are the e-skills for digital inclusion that are currently being supplied and considered important by the WC CoLab initiative?

3. *What are the appropriate approach guidelines in providing e-skills for digital inclusion?*

- Which approaches and methods of providing e-skills for digital inclusion are used in 'best practice' initiatives, as reported in the relevant literature?
- Which approaches and methods of providing e-skills for digital inclusion form part of the WC CoLab initiative?

1.4 Research objectives

In accordance with the identified research problem, the following research objectives were established:

The main objective:

The main objective was to gain conceptual clarity on digital inclusion and the relevant e-skills for digital inclusion and to draw up recommendations on a suitable approach to the development and adoption of e-skills for digital inclusion in the Western Cape.

Sub-objectives:

1. Gain conceptual clarity of digital inclusion and the identification of barriers to its attainment;
2. Clarify the meaning(s) of e-skills for digital inclusion and clusters of e-skill sets for digital inclusion
3. Identify appropriate approach guidelines to develop these e-skills;
4. Develop a conceptual framework related to e-skills for digital inclusion in the WC.

1.5 Approach to this study

Once the research questions and objectives had been established, an appropriate research design was created. This research design is presented below in the form of steps:

1.5.1 Research design

- Identify a current research problem;
- Establish research questions and objectives;
- Conduct a comprehensive literature review of DI, relevant e-skills and important approach issues to the delivery of e-skills;
- Develop a literature-based conceptual framework for testing;
- Select the case study methodology within the qualitative paradigm to test the conceptual model;
- Collect data from semi-structured interviews, observations and relevant documents;
- Analyse empirical data through the method of constant comparison;
- Report and discuss empirical findings in relation to literature;

- Propose a final conceptual framework which works towards the development of digital competence for digital inclusion in the Western Cape.

1.5.2 Selected methodology and application

The interpretive perspective was adopted because of the need to gain an understanding of complex information based on the subjective perceptions of those that received and provided e-skills for DI training. In keeping with this decision, a qualitative approach was used. This is concerned with the quality or richness and depth of data, enabling the researcher to gain deeper meaning and insight into the stories and views of the subjects. Contextual factors are clearly relevant as influencing the phenomenon in question.

Case study, a method used in qualitative research, provides an opportunity to obtain deep insight into a small number of cases in their natural settings. It was chosen because this investigation aimed at creating new knowledge about a phenomenon. In this instance, there was the limited knowledge of e-skills for DI and delivery approaches in a WC setting.

Purposive sampling was used to select the 13 participants. Semi-structured, face-to-face interviews were conducted with these participants. The data thus obtained were analysed using the constant comparison method, a component of the Grounded Theory approach. This entailed searching for similarities, patterns and trends in each of the interview transcripts and labelling these according to certain themes and categories. The patterns that emerged were used to create a conceptual model illustrating DI elements, e-skills for DI and e-skills delivery approach factors.

1.6 Findings

The findings of this study suggest that DI in the WC context should be perceived as a matter of human capacity development aimed at addressing priorities such as employment and education. The study is particularly concerned with reducing social and economic inequalities through increased societal participation, social innovation, empowerment and upliftment. The starting point should be to enable digitally excluded and marginalised groups to access information and thus raise the level of their ICT competences. This should lead to gradual changes in behavioural patterns

and an improved quality of life. This research has confirmed the lack of awareness and access to ICT, negative attitudes, poor education and language difficulties as significant barriers to these objectives in disadvantaged WC communities.

The main barrier in this context is e-skills or rather the significant lack of these skills in marginalised WC communities. Although the research set out to identify the required e-skills for DI, it became clear that certain knowledge and attitudes play a seminal role. Based on this finding, the working term '*digital competence*' (a combination of knowledge, skills and attitudes) for DI is deemed to be a more fitting term than DI. These competence areas range from very basic and technical proficiencies to an increasing focus on cognitive and critical thinking capacities. Certain competence areas (i.e. basic; technological; information-related; media-related; and communication and collaboration) are strongly related to short-term DI intentions, while others (creation of content, real-time thinking and transferable competences), are more likely to be relevant to the broader conceptualisation and desired impacts of DI.

Appropriate approach guidelines for delivering digital competence for DI, particularly in the context of underprivileged WC communities, include: raising awareness of ICT related benefits and the availability of training opportunities; providing some form of access to ICT; implementing blended (face-to-face and online) learning; adopting a learner-centred perspective; demonstrating more beneficial and higher quality uses of ICT; managing poor levels of education; incorporating multi-stakeholders; tailoring the programme to suit specific target groups, the relevant contextual factors and points of interest; not separating trainees on the basis of level of skill and; integrating formal with informal and innovative strategies.

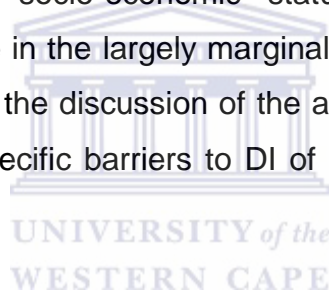
1.7 Significance of research

DI initiatives, particularly in developing countries, are often implemented without sufficient or thorough knowledge of the issues involved. Given that areas of it have long been perceived as vague, confusing and generally misunderstood in many settings, and that there is a lack of consensus as to what is to be achieved for whom and how, this research is significant in that it attempts to address a field of knowledge which is under-researched. This research therefore has the potential to

provide greater understanding of DI and contribute towards creating a framework that is aligned with national priorities. This is specifically relevant in the WC, where there is a serious shortage of e-skills because national and provincial initiatives have reached few of the most vulnerable citizens. It is envisaged that the WC will benefit from this kind of focused research. It offers an overview of both international and national knowledge and adds to the evidence-based contributions that have already been made. This research could therefore help to address the massive challenges of social exclusion, unemployment and building cohesive and sustainable communities in the WC.

1.8 Delimitation of this study

The scope of this research is limited to the WC province of South Africa. Findings are not necessarily applicable to other regions. Although the findings relate to all WC citizens regardless of their socio-economic status, this study is particularly concerned with those who live in the largely marginalised or disadvantaged areas in the province. For that reason, the discussion of the aspects of digital competence is focused on the needs and specific barriers to DI of marginalised or disadvantaged communities.



1.9 Chapter outline

The rest of the chapters in this thesis are structured as follows:

Chapter 2 provides a review of relevant literature. It explores particular perspectives on: i) DI; ii) e-Skills for DI and iii) Approach guidelines for the delivery of e-skills for DI. It concludes with a brief summary of each aspect, including a review of the literature on e-skills and a discussion of the developing conceptual framework of this thesis.

Chapter 3 focuses on the research design and methodology of the study. It describes the approaches and methods used during the research and the reasons for selecting them.

Chapter 4 presents the empirical findings revealed as a result of data collection and analysis. The discussion of the findings is related to the literature discussed in

Chapter 2 as a form of triangulation as well as a means of answering each of the research questions.

Chapter 5 proposes a conceptual framework, which illustrates the research findings and the answers to each of the three research questions. Each component in the framework is described.

Chapter 6 concludes the study. The practical recommendations, including areas of possible future research, are based on the findings. Finally, the contributions and the limitations of the study are explored.




CHAPTER 2: LITERATURE REVIEW

2.1 Introduction

This chapter presents a review of the literature on each of the areas that are relevant to this study, based on its research questions and objectives. It begins with a discussion on digital inclusion (DI), in an attempt to appropriately conceptualise the term, including its embedded elements and intentions. The DI section examines the groups that are frequently digitally excluded, as well as the most prominent literature-based barriers to DI. E-skills are explored next, with focus on conceptualisation, fundamental concepts and the more specific e-skill sets for DI identified in various frameworks. This is followed by examining approaches related to e-skills delivery, according to reviewed literature. The chapter concludes with a short summary of the significant literature-based findings.

2.2 Digital Inclusion

2.2.1 Conceptualising Digital Inclusion



Digital inclusion... is a ubiquitous term that is rarely explicitly defined. It is possible to read a whole report or article and by the end not know exactly how the author is defining digital inclusion. The vagueness around the term means that digital inclusion is in danger of becoming a meaningless concept...
(Seale, 2009, p. 3)

To begin with, it is important to recognise that knowledge has become a valued commodity in modern society and is considered vital for productivity, progress, development and the improvement of quality of life (GeSCI, 2011; Pannu & Tomar, 2010). In keeping with this, there is a global movement to develop information and knowledge based-societies or knowledge economies. These are defined as “economies which are directly based on the production, distribution and use of knowledge and information” (OECD, 1996, p. 7). Technological advancements have resulted in an enormous amount of information and services, which are currently offered in digital form. The nature of ICT has grown to include computers, the Internet and wireless technology together with older forms of communication like the

telephone and television, revolutionising the way in which we access and manage information (Pannu & Tomar, 2010). Consequently, these resources have transformed the way society functions, from the simplest of daily activities to work, communication and learning and leisure (Ala-Mutka, 2011; de Hoyos, Green, Barnes, Behle, Baldauf & Owen, 2013). ICT therefore affords a wealth of opportunities and benefits to those in a position to capitalise on them (International ICT literacy panel, 2007; Mariën & Van Audenhove, 2010; Seale, 2009; Timmers, 2008). However, while some have profited, others – generally the marginalised or those of lower socio-economic standing – have remained excluded (Garrido, Sey, Hart & Santana, 2012; Gigler, 2004). ‘Marginalised’ is a frequently used term, which is not often defined. Rahman (2006) explains these groups as the disadvantaged members of society, unable to capitalise on opportunities unlike many others. Efforts to correct this and bring about some form of equality have resulted in the birth of the term digital inclusion (DI).

DI is an evolving concept, which is largely interrelated with a host of other concepts (Seale, 2009). The most salient is the concept of the digital divide, which in many cases, is giving way to the more recent DI (Parsons & Hick, 2008). Quite simply, this divide refers to the split between different members of society, commonly referred to as the ‘haves’ and ‘have-nots’ or more recently, as a result of the dominance of the Internet, the ‘connected’ and the ‘unplugged’ (DiMaggio & Hargittai, 2001; Pannu & Tomar, 2010; Salman & Rahim, 2012). Although these terms are quite commonly used, they carry some misconceptions. It is extremely difficult to neatly assign labels, identifying some as in and others as excluded (Warschauer, 2003). Van Dijk and Hacker (2000, p. 16) perceive the matter as “relative and gradual differences” that are nevertheless significant as “in the information and network society relative differences in getting information and lines of communication become decisive for one’s position in society, more than in every society in history before”. Along with the reasons for these differences and inequalities, discussions on the digital divide have paid particular attention to the potential of technology to intensify and broaden the divide rather than lessen inequalities (Chigona, Beukes, Vally & Tanner, 2009; DiMaggio & Hargittai, 2001; Olfhert, Damodaran & May, 2005).

At the outset, discussions surrounding the digital divide and consequently DI centred on the provision of physical access to technology (DiMaggio & Hargittai, 2001; Nita, 2011). Access initially referred to computers only, but it has increasingly come to refer to all forms of ICT, particularly the Internet. It was once thought that the provision of these technologies was sufficient to bring about equality and bridge the divide. However, it soon became evident that mere access to material resources does not automatically result in digital inclusion (Salman & Rahim, 2012). The widespread use of mobile phones across all sectors of South African society has “not reduced digital exclusion but improved universal access to communications technology to a limited extent” (Lesame, 2013, p. 74). Hargittai (2002, conclusion sec.) aptly states:

Like education in general, it is not enough to give people a book, we also have to teach them how to read in order to make it useful. Similarly, it is not enough to wire all communities and declare that everyone now has equal access to the Internet. People may have technical access, but they may still continue to lack effective access in that they may not know how to extract information for their needs from the Web.

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With this realisation, focus on access soon turned to meaningful smart use of technology, largely dependent on possessing the necessary skills to do so (Selwyn & Facer, 2007). This “second-level digital divide” (Hargittai, 2002) redirected the nature of DI conversations to the subject of skills, giving rise to debates surrounding the specific abilities necessary for inclusion. While the issue of access remains globally relevant (particularly in a developing country context), skills and the context of use have increasingly been considered an even more pressing concern in the information and knowledge-based society (Van Dijk, 2013). Along with facing increasing exclusion, according to Ala-Mutka (2011), those lacking necessary skills are ill-equipped when engaging with ICT and therefore further at risk in terms of the potential dangers accompanying the use of modern technology. Additional factors affecting quality of use include content, attitudes, and more recently social capital (Bradbrook & Fisher, 2004; Meyer & Muller, 2006). Together, all of these elements affect what has been emphasised as the **effective** use of ICT (Warschauer, 2003). When considering DI in relation to effective usage, an appropriate DI definition may

be “the best use of digital technology, either directly or indirectly, to improve the lives and life chances of all citizens and the places in which they live” (HM Government, 2008, p. 8). This definition also implies that the purpose of ICT should be to enhance activities already present in people’s lives, affecting what’s relevant to them and simplifying current lifestyles (Mariën & Van Audenhove, 2010). The ‘adoption and domestication’ theory supports this, where adoption refers to having access to technology while domestication is the actual incorporation of the technology into one’s own life, making it a part of daily reality and quite often transforming ICT from something unnecessary or a luxury to somewhat of a necessity (Mariën & Van Audenhove, 2010).

Perhaps the most significant aspect of the previously suggested definition could be the aim: “...to improve the lives and life chances of all citizens” (HM Government , 2008, p. 8). As such, DI has been perceived by many as a means of human capacity development (Rahman, 2006). Since it is largely concerned with eliminating social disadvantage as well as poverty, the use of ICT is often considered a sociological (as opposed to a technological) issue (Helsper, 2008; Van Dijk, 2013; Warschauer, 2003). Consequently, the impact of DI is widely discussed under the umbrella of social inclusion – “the societal objective of eliminating poverty and social inequalities” (Nita, 2011, p. 65). Warschauer (2003, p. 12) describes the connection between ICT and social inclusion as follows:

1. A new information economy and network society have emerged;
2. ICT plays a critical role in all aspects of this economy and society;
3. Access to ICT broadly defined can help determine the difference between marginalization and inclusion in this new socio-economic era.

The effective use of technology is generally said to either promote social development or reinforce and deepen existing inequality. DI is therefore aimed at “...reducing marginalization, poverty, and inequality and enhancing economic and social inclusion for all” (Warschauer, 2003, p. 216). For this reason it has been conceptualised by some as “social inclusion in the 21st century” (Division of Governmental Studies and Services, 2013) or “social inclusion with an ICT stream” (Bradbrook & Fisher, 2004, p. 2).

Social exclusion [as opposed to inclusion] is a shorthand term for what can happen when people or areas suffer from a combination of linked problems such as unemployment, poor skills, low incomes, poor housing, high crime environments, bad health and family breakdown. Social exclusion is a politically contentious concept. It is multi-dimensional and not simply related to income (Foley, Alfonso & Ghani, 2002, p. 6).

There is a close relationship between DI and social development. However, it would be wrong to assume that ICT adoption automatically eliminates social exclusion (Gigler, 2004; Mariën & Van Audenhove, 2010). Those who have placed technology at the centre of the argument have been criticised by others who believe that “the prizes we are seeking are social and not technological” (HM Government, 2008, p. 8). They see DI as striving to use ICT to achieve important developmental goals and “improve the quality of life of the population, mainly in countries with urgent social needs” (de Holanda & Dall'Antonia, 2006, p. 30). It should be possible to attain this objective by increasing the participation of excluded groups in society, through the increase and exchange of knowledge, information and communication (Timmers, 2008). Participation is often listed as a greater purpose of DI and an essential component of its conceptualisation (Hargittai & Walejko, 2008; Warschauer, 2003; Wynne & Cooper, 2007). Using ICT for greater social, economic, cultural and political participation is believed to increase the power and capacity of the marginalised to improve their own lives (Gigler, 2004; Wessels, 2013).

It is imperative to consider DI in relation to power. According to Wessels (2013, p. 25), “The allocation of resources is related to positions of power, with those with the least resources having less power in determining their futures, securities, and freedoms to participate.” Resources in this context refer to the broad range of human, digital, physical and social elements that make full participation within modern society possible (Warschauer, 2003). ICT’s role in providing access to information, the acquisition of appropriate skills and other resources to make full participation in society possible has become just as crucial as that of education (Gigler, 2004).

Empowerment is an important objective of DI (Rahman, 2006). However, the use of the term has become so widespread in modern developmental narratives that its

significance generally goes unquestioned. It is used so pervasively that it has become as vague and abstract as DI itself. In his exploration of empowerment, Weissberg (1999, p. 2) observed how it has come to be considered the miraculous cure to all of society's problems: "...some advocates unthinkingly voice 'empowerment' as if it were a magical phrase capable of exorcising demons." Along with challenging the accuracy of the notion that empowerment is the solution to all the struggles many marginalised groups face, Weissberg (1999, p. 11) also questions the process of teaching these groups to be empowered: "Is it possible to instil empowerment by telling those in inferior positions how to be empowered?" Weissberg's concerns highlight the importance of appropriately defining empowerment. A fitting definition may be "...the process of increasing the assets and capabilities of individuals or groups to make purposive choices and to transform those choices into desired actions and outcomes" (The World Bank, n.d). Empowerment encompasses the concepts of self-determined change, self-reliance and freedom of choice (The World Bank, n.d), objectives shared with the notion of DI in the sense that technology should afford people more personal control and independence (Gigler, 2004; Seale, 2009). Lacking the necessary resources to participate in the information society may then potentially lead to dis-empowerment. However, this is not applicable to every digitally disengaged individual. A distinction should be made between those possessing the necessary resources to fully participate and yet exercise an "empowered choice" to abstain, as opposed to those who lack the resources to participate (Selwyn & Facer, 2007, p. 4). Empowerment in a DI context is therefore characterised by access to the wide range of resources to enable an informed choice as to whether or not to participate and to what extent to do so. The significance of empowerment as an objective of DI is observed by Lesame (2013, p. 74 citing Padayachie, 2010, p. 23): "A former South African Minister of Communications stated that 'the ultimate goal of developing an Information Society is to empower individuals to be able to access the world of electronic information and utilize it'."

What is needed is more definition of the areas in which DI really comes into play and where DI offers a host of potential opportunities for growth. The central capacities and realms in which DI could impact quality of life are identified as: (i) economic, (ii)

social, (iii) health, (iv) political, (v) civic, and (vi) cultural. A brief discussion of each of these elements follows.

2.2.1.1 Economic

“Technology is a powerful engine of innovation and economic growth in today’s world” (IMLS et al., 2011, p. 25). So much so, in fact, that those such as Wynne and Cooper (2007, p. 11) have characterised DI as the modern citizen’s means of “economic empowerment”. Being able to interact efficiently with ICT is therefore vital for economic growth by both individuals and businesses alike (IMLS et al., 2011). Romani (2009a) states that the current labour market requires skilled individuals, able not only to interact with ICT, but also effectively process and deal with information and knowledge. The information and knowledge society we find ourselves in means that these skill requirements are not restricted to ICT fields, but apply to most occupations, across all sectors (Garrido, Sullivan, & Gordon, 2012). Obtaining or improving work opportunities for economic growth is a major reason for acquiring digital skills, particularly in less developed areas where the need for this sort of financial growth is higher (Garrido et al., 2012b).

Possessing these skills also allows increased access to markets and services on an international scale, which not only drastically increases options but also results in potential consumer savings (Chigona et al., 2009; Gigler, 2004; PricewaterhouseCoopers, 2009; Selwyn & Facer, 2007). Salman and Rahim (2012) have found that although the Internet is fast becoming a platform for convenient shopping and e-business, it is still greatly underused in this respect. They argue that this is a particularly valuable element of DI for both older and younger generations. The ease with which services may be accessed from home, as well as the increased ability of citizens to work from their respective homes or wherever they so choose, is a huge benefit, especially to those who have physical or geographical mobility challenges or would otherwise be largely excluded from the labour market (Bianchi, Barrios & Cabrera, 2006; Wessels, 2013). Income is also improved through reduced transportation costs (Gigler, 2004).

2.2.1.2 Social

“Technological and social realms are highly intertwined” (Warschauer, 2003, p. 205). ICT and particularly the Internet provide far better means of communication than

ever before, whether to maintain old relationships or make new connections (Ala-Mutka, 2011; IMLS et al., 2011). The extent to which the Internet has become an integral part of modern social settings is illustrated in Pannu and Tomar's (2010, p. 16) comment that "[t]he Internet can be compared to sitting at the local coffee shop". Social media, networks, discussion forums, self-help groups, interest groups and the general exchange of information offer increased interaction and support (Bianchi et al., 2006; IMLS et al., 2011). In underprivileged communities, social engagement is viewed as an important reason for developing ICT skills, which has been found to instil a sense of pride and improved self-esteem (Gigler, 2004). In this respect, DI has been particularly useful for the inclusion of those who have difficulty engaging socially e.g. the elderly and people living or working in distant, secluded locations (Ala-Mutka, 2011).

2.2.1.3 Health

Information related to health needs or concerns is now readily available. This could mean improved communication and a significantly larger audience. Technology also improves patient care, often enabling many to manage their own conditions more effectively and independently (IMLS et al., 2011). In addition, the Internet offers support systems for those affected by illness or undergoing rehabilitation (Ala-Mutka, 2011). Particularly in remote areas with few health facilities, the provision of technologies and the skills to efficiently use them could have a significant impact on health care, as well as potentially saving time and money (Catts & Lau, 2008; IMLS et al., 2011). Finally, technology could also be put to use to minimise the negative effects of illness, disability and ageing, thereby improving quality of life (Bianchi et al., 2006).

2.2.1.4 Political

Enhanced access to content/information/knowledge... on decisions that relate to issues of concern to society's marginalised groups, can contribute to a sense of more accountable, transparent and responsive social policy-making and help these marginalised groups to feel more strongly plugged into public life and the political process in their communities. (Bianchi et al., 2006, p. 34)

ICT makes it possible for people to have access to government information and services (e-government) which are "developmental, agile, competent and citizen-

centric” (Mitrovic et al., 2012). E-Participation in the political sphere contains both top-down and bottom-up components where both the government and users are able to initiate interaction. These online services should help them to be aware of important political issues, to be able to express their views and opinions, to communicate with officials, local government and institutions and to have a voice and degree of power in decisions which affect them and are often made on their behalf (IMLS et al., 2011; Gigler, 2004).

2.2.1.5 Civic

The capacity to use ICT opens up a world where citizens can be constantly updated about current events both locally and internationally. In addition, they are able to voice their opinions and concerns. e-Participation and the concept of active citizenship are particularly important for active community engagement, rallying community members to a particular cause and enabling people to have a sense of ownership of what happens in their communities (Ala-Mutka, 2011).

2.2.1.6 Cultural

Creative expression and knowledge sharing through the use of ICT have become major factors in society. Today, ICT is increasingly used in creative expression of culture, often leading to heightened awareness and strengthening of an individual’s own cultural identity (Gigler, 2004). Knowledge exchange takes place daily on personal and professional levels with diverse groups of people from around the globe (Ala-Mutka, 2011). ICT has therefore been a useful means of integrating cultures, particularly in the case of immigrants (Ala-Mutka, 2011). ICT has even had an impact on religion and spirituality, changing the manner in which many practise their religion and converting others. However, cyber evangelism, cyber spirituality and virtual prayer may also succeed in destroying faith (Pannu & Tomar, 2010). Lifelong learning is another avenue of knowledge building possible through ICT and the increasing amount of innovative learning opportunities (Bianchi et al., 2006; Ala-Mutka, 2011).

It is obvious why DI is surrounded by so much confusion given the range of concepts embedded in it. Perhaps the clear conclusion from this discussion is that DI is a multifaceted term. At present, however, the definition of the different components that compose it generally varies from one opinion to the next (Seale, 2009; Selwyn &

Facer, 2007). A useful way of drawing these interrelated aspects together in a logical and holistic manner is to see DI in terms of outcomes and impacts (Garrido et al., 2012a; Seale, 2009). A distinction should be made between outcomes that represent more direct results and impacts that refer to the broader changes made as a result of the outcomes (Zint, n.d). In referring to DI, Garrido et al. (2012a, p. 16) state that “the range is from outcomes (e.g. uses and usage) to short-term impacts (e.g. behavioural changes), to long-term impacts (e.g. changes of status in such areas as social inclusion, income, civic participation, and education)”. Considering DI in this manner is useful in that it takes account of the complex nature of the subject, and includes but makes distinction between its basic and broader components. At the same time, however, it shows how limited most definitions of the concept are, often emphasising some of the previously discussed aspects and underplaying or even ignoring others. An exact definition of a concept as fluid, complex and multifaceted as DI with its intricate nuances is likely to be elusive. One of the more comprehensive and widely adopted definitions stems from the eEurope Advisory Group, and incorporates most of the discussed elements. According to this, DI (in this instance referred to as e-inclusion) is considered as:

[T]he effective participation of individuals and communities in all dimensions of the knowledge-based society and economy through their access to ICT, made possible by the removal of access and accessibility barriers, and effectively enabled by the willingness and ability to reap social benefits from such access... Further e-inclusion refers to the degree to which ICTs contribute to equalizing and promoting participation in society at all levels (i.e. social relationships, work, culture, political participation, etc.). (Kaplan, 2005, p. 7)

Figure 1 presents the conceptualisation of DI, which has resulted from this discussion. The logic of the model is that specific DI requirements (i.e. access to ICT, appropriate skills and effective usage) lead to short-term outcomes, which at the most simple level entails basic use of ICT for personally relevant purposes and benefits. Although there is not a definite and direct correlation between them, the literature proposes that these outcomes result in short-term impacts – gradual behavioural changes leading to improved quality of life and overcoming some of the

challenges affecting disadvantaged communities (e.g. new knowledge leading to better nutrition for improved health). It is envisioned that this eventually leads to impact on a much broader (individual and societal) scale, which generally coincides with national social development objectives. These include increased (social, cultural, economic, civic, health or political) participation in society, empowerment and social inclusion of marginalised groups, as well as the creation of an information and knowledge-based society. The area of skills (a requirement for DI) is highlighted in order to indicate the focus of this study, i.e. e-skills for DI.

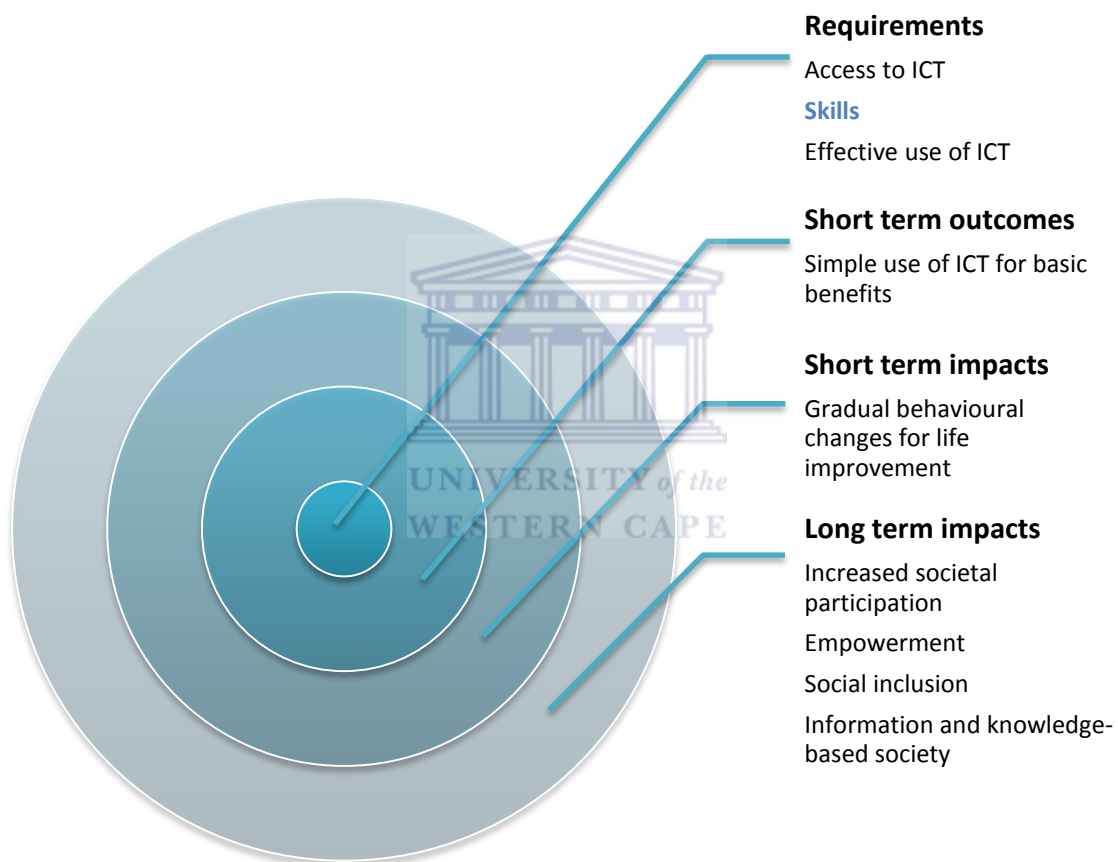


Figure 1: Literature-based conceptualisation of Digital Inclusion (Source: Author)

Certain groups are consistently found at the excluded end of the DI continuum. For an in-depth discussion to be possible, these groups need to be identified, as well as the most common reasons for their exclusion. The following section identifies the citizens who are digitally excluded and the barriers they face.

2.2.2 Digitally excluded groups and barriers to Digital Inclusion

Those most likely to be digitally excluded usually belong to society's marginalised clusters (Meyer & Muller, 2006). These categories generally consist of very specific groups and ICT has an imperative role to play in improving their circumstances and reducing societal inequalities (Kárpáti, 2004). Unfortunately it is particularly these socially disadvantaged groups, who should be most assisted through ICT, who realistically gain the least (Helsper, 2008). The digitally excluded are typically found amongst the socially and economically excluded (particularly lower income households, the unemployed, homeless and less educated), certain disabled or special needs groups, rural or geographically remote communities, some minority² ethnic groups, non-English speakers, the elderly and certain women (Foley et al., 2002; Kárpáti, 2004; Meyer & Muller, 2006; Olphert et al., 2005; Sinclair, Bramley, Dobbie & Gillespie, 2007). Van Dijk (2013) distinguishes between opposing pairs where one group is repeatedly proven to be more excluded than the other e.g. the unemployed and employed, blacks and whites, or at a broader level developing and developed countries. It is no coincidence that in each case the digitally excluded group directly correlates with the traditionally socially disadvantaged as it is generally the same systemic inequality that reinforces and perpetuates these patterns (Warschauer, 2003).

It is common for these citizens to fall into more than merely one of the disadvantaged categories thereby increasing their likelihood of digital exclusion, e.g. the elderly, who are more likely to have some form of visual or physical impairment along with potentially lower education levels and be more socially isolated; minority ethnic groups with a stronger likelihood of lower socio-economic status (SES), related to income, education and occupation, and are less likely to have English as a first language (*Ethnic and Racial Minorities & Socioeconomic Status*, n.d; Foley et al., 2002; Sinclair et.al, 2007). Low income (and poverty), unemployment and lack of education are all interrelated and fall under the larger umbrella of what is commonly referred to social exclusion (United Nations Development Programme, 2006). Figure 2: Literature-based digitally excluded groups (Source: Author) presents these typically digitally excluded categories.

² The term 'minority' refers to groups who typically hold less power in society. It is not a quantitative indicator, referring to a group with fewer members (Minority Groups, n.d).



Figure 2: Literature-based digitally excluded groups (Source: Author)

These examples of excluded groups (with a lack of e-skills) give an indication of the barriers to DI. The following were revealed as the most prominent barriers to DI and in most cases also the barriers preventing the development of the e-skills required for DI: (i) awareness and knowledge; (ii) access to ICT; (iii) education; (iv) the quality of use; (v) attitudes; and (vi) language.

2.2.2.1 Awareness and knowledge

Although ICT has penetrated a large percentage of the global population, much of the world remains unaware of the extent of the uses of technology or the potential benefits. Foley et al. (2002, p. 40) have appropriately concluded: “The bottom line is that if there is no benefit to socially excluded groups in using ICT they are very unlikely to make use of it.” It then naturally follows that these groups would need to be aware of these benefits, in order for them to want to interact with the technology.

A “lack of perceived value” accompanied by a general disinterest in the use of ICT has been strongly correlated with a lack of awareness of these potential benefits (The Economist Intelligence Unit, 2013, p. 24). The specific areas of awareness according to Foley et al. (2002, p. 42) have been identified as:

- Awareness of the ways in which ICT can be used in everyday life and work
- Awareness of ICT access or availability
- Awareness of ICT impact and benefits

Olphert et al. (2005) found that particularly amongst the elderly, awareness of ICT and the potential ways of accessing the Internet were low. Interestingly (given that the context of this research is community e-centres), Olphert et al. further reported that the large majority of non-digitally engaged elders were unaware that the Internet could be accessed at these public centres. Older non-users were also found to be generally unaware of the range of services and uses of the Internet and its relevance and benefits to them personally. Although the findings of Olphert et al., related specifically to the elderly, this lack of awareness is prevalent amongst non-users of all ages. South African studies indicate that many initiatives providing public Internet access failed to make community members sufficiently aware of either the existence of these facilities or the uses of the provided technology (Chigona et al., 2009). Chigona et al. further discovered that a significant group of people were generally completely unaware that mobile technology existed or did not know that their cellular phones had the capacity to access the Internet. Those that did know had very limited knowledge of the extent of the Internet uses through mobile phones.

In these cases more outreach activity is often required and inexperienced users may need to be approached, assisted and guided into using ICT and developing the necessary skills to do so (Foley et al., 2008). Outreach activity is particularly required in more isolated groups with fewer social networks (Helsper, 2008). Social groups like these that have negative views of ICT and choose not to engage, increase the likelihood of an individual opting to remain excluded (Mariën & Van Audenhove, 2010). Any means of increasing ICT awareness should focus specifically on demonstrating the uses and benefits of technology which would capture the interest and be relevant to the specific target group. Showcasing modern intricate (and likely personally irrelevant) gadgets to elderly non-users, completely unfamiliar with ICT is

not only likely to defeat its purpose, but also serves to be intimidating action, pushing them further into exclusion. Such forms of technology may be much more suited to attracting younger users; introducing email and simple forms of technology may be more appropriate for older citizens.

2.2.2.2 Access to ICT

Although the narrow conception of access as the only obstacle to DI has changed, this has not erased the fact that availability to various forms of ICT continues to be an issue for many (Attwood, Diga, Braathen & May, 2013; Department for Communities and Local Government, 2008). Availability of infrastructure and affordability of ICT remains a difficulty making physical access a challenge for many of the underprivileged (Foley et al., 2008; Livingstone, Van Couvering & Thumin, 2008). Financial constraints and poor infrastructure often result in access to technology becoming a major obstacle in rural areas or remote locations, particularly Internet connections (Chigona et al., 2009; Perlmutter, Ungerleider, Scott, Jones, Jenkins, Wilson & Hoechsmann, 2010). e-Centres, commonly referred to as telecentres are largely the only point of access for a majority of the disadvantaged (Benjamin, 2001): “It is a shared community facility for those who cannot acquire ICT services due to challenges such as affordability and access; specifically developing marginalised communities.” (Stoltenkamp et al., 2013, p. 3485) International discussions surrounding access have shifted to the type and speed of connectivity (Selwyn & Facer, 2007; The Economist Intelligence Unit, 2013). Specifically in South Africa, “broadband access (particularly access to fixed broadband) remains very low in comparison to other lower-middle-income countries, and the prices of all communication services remain high by both African and global standards” (Gillwald, Moyo & Stork, 2012, p. executive summary). Consequently, intermittent connectivity has proven to be a contributing factor in the failure of certain South African DI initiatives (Chigona et al., 2009).

As mobile technology has become the means of ICT interaction for a large majority of the global digitally included population, the bulk of the discussion has centred on the possibility of mobile technology becoming the solution to digital exclusion, particularly in developing countries where access to traditional computers is low. This may seem plausible especially considering the large number of mobile phones

in countries such as South Africa. However, Internet access through mobile technology by marginalised groups is very limited, as can be seen in national statistics as well as studies which indicate that a majority of South Africans are unable to afford mobile phones capable of Internet connection (Chigona et al., 2009; Statistics South Africa, 2011). Even where the challenge of physical access to ICT devices is overcome, low income makes it difficult to afford cost incurring applications and services. As a result many lower income groups still communicate mainly via short message service (SMS) (Alampay, 2005). The fact that many countries focus almost entirely on providing broadband as their main DI strategy is clear evidence of the importance of having reliable and fast access to the Internet (The Economist Intelligence Unit, 2013).

Greater access (e.g. home access) allows for more opportunities to participate in beneficial activities and is especially important for higher level tasks, particularly content production and sharing, which generally require more time (Hargittai & Walejko, 2008). Proficiencies such as level of Internet navigation skills have also been directly linked to the amount of time spent improving these capacities as was evident in Hargittai's (2002) research. In this case, those who had an hour or less Internet interaction per week were far less capable and efficient in obtaining relevant information than their counterparts. Marginalised communities generally lack the financial resources to afford private Internet access and often do not have sufficient use of public access. Thus, although some have the basic skills to perform certain online activities, they do not have sufficient access to explore and benefit from technology in substantial ways.

Access is sometimes problematic because of the physical mobility problems many of the disabled experience (Helsper, 2008; Livingstone et al., 2008). Other forms of disability could also be considered barriers to inclusion, e.g. visual impairment, causing many to avoid the use of modern technology (Bradbrook & Fisher, 2004). Sometimes access is indirect or unintentional. For instance, people with children, who are typically considered society's "digital natives" (Ala-Mutka, 2011, p. 21) and likely to interact with technology in the home environment, are more digitally engaged adults than their childless counterparts (Helsper, 2008; Van Dijk & Hacker, 2000). This kind of indirect access may be particularly useful for housewives thought

to be an excluded group because of their lack of access to ICT in work or learning environments (Munte-Kunigami, 2011).

2.2.2.3 Education

Poor levels of education and a lack of basic literacy make e-skills acquisition a highly significant challenge (Foley et al., 2002; Livingstone et al., 2008). Studies have indicated that education is a necessary foundation for the development of ICT skills and that the more educated consistently perform better than their less educated counterparts (Van Dijk, 2013). Basic literacy (i.e. reading, writing and numerical skills) developed in the schooling system is imperative for effective functioning in the information age. A lack of basic literacy has especially been discussed in relation to the elderly and their lack of opportunities to develop the necessary ICT skills (Sinclair et al., 2007). However, the current education challenge in South Africa has resulted in alarmingly high levels of illiterate or uneducated youth, extending this barrier to the younger demographic as well. Further education platforms (particularly tertiary education) also allow for the development of more intricate cognitive abilities, necessary in the less technical e-skills elements. Lack of this range of abilities prevents many from reaping the benefits of digital engagement but also results in many illiterate adults avoiding skills training opportunities (Foley et al., 2002). It is therefore imperative that DI strategies take this into account and provide training in a dignified manner (Intelligent Community Forum, n/d).

2.2.2.4 The quality and context of use

Van Dijk (2000) discusses a possibly more complex barrier. This is using ICT ineffectively, which means it does not necessarily result in significant or optimal benefits. Those with very basic e-skills may be digitally engaged but are a far remove from others who are able to use more advanced forms of technology or really empower themselves through the extensive range of services, more intricate applications, devices and the abundance of available information. This constitutes a barrier to inclusion for some. In many cases quality of use is largely dependent on skill level, where the possession of certain skills and lack of others restricts some to “passive, consumer-type of use instead of active use for personal creation and development” (Ilomaki, Kantosalo & Lakkala, 2011, p. 4). Along with delivering e-skills, training initiatives that introduce new users or expose existing ones to

meaningful and optimal uses of technology have the potential to overcome this barrier or avoid it altogether.

2.2.2.5 Attitude

Attitudes play a large and significant role in whether or not people choose to engage with ICT as well as the way in which they decide to make use of it (Helsper, 2008). Certain segments of the population choose to remain excluded because they associate technology with pressure and so deny themselves the potential benefits of digital engagement (Tapscott, 2012). Apprehension and even fear of ICT and its effect on the individual's personal, social and professional life and wellbeing are reasons for many others choosing to remain excluded (Helsper, 2008). Van Dijk (2000) initially referred to this as the "psychological" or "mental access" barrier. The perception of digital technologies as youth or work-orientated (HM GOVT, 2008) is common and often leads to "dismissive views" (FreshMinds, 2008, p. 32), particularly in the elderly and in low income groups. Wheeler (2003) also found that certain elderly groups have negative perceptions of the Internet as they believe it to clash with traditional family-orientated values, in the sense that the youth were spending less time with them and more online. Others avoid ICT devices simply because they are afraid of damaging them (Cushman & Klecun, 2006). Fear and other negative attitudes or perceptions are particularly evident where privacy and regulation of Internet banking are concerned (European Committee for Standardization, 2010; Olphert et al., 2005). Recent research in the WC supported these findings. It showed that lack of confidence in online security made many feel at risk during digital transactions or not use these services at all (Alfreds, 2013).

Confidence is closely intertwined with the term "self-efficacy". This refers to an individual's personal belief in his or her own ability to perform a task, regardless of the actual capacity or skills possessed (Helsper, 2008). A person who perceives himself or herself to be very poorly equipped in terms of digital skills may simply avoid using technology. Lack of skills (whether real or perceived) often result in a lack of personal confidence and even trust in ICT (FreshMinds, 2008, p. 36).

2.2.2.6 Language

The overwhelming dominance of the use of English in technology, particularly in Internet and media text means that language may be a possible obstacle in the use

of ICT for some, particularly where English is not the individual's first language (Foley et al., 2002; Livingstone et al., 2008; Perlmutter et al., 2010). Another reason is that much of the writing on the Internet is presented in a very academic or sometimes business orientated fashion, increasing the difficulty level for these citizens, particularly in understanding and creating media and dealing with information (Gigler, 2004; Livingstone et al., 2008). Fortunately, translations are more readily available on websites and other digital formats (Perlmutter et al., 2010). It is also true that ICT skills training can help to improve language skills (Garrido et al., 2012b; Kluzer, Ferrari & Centeno, 2011).

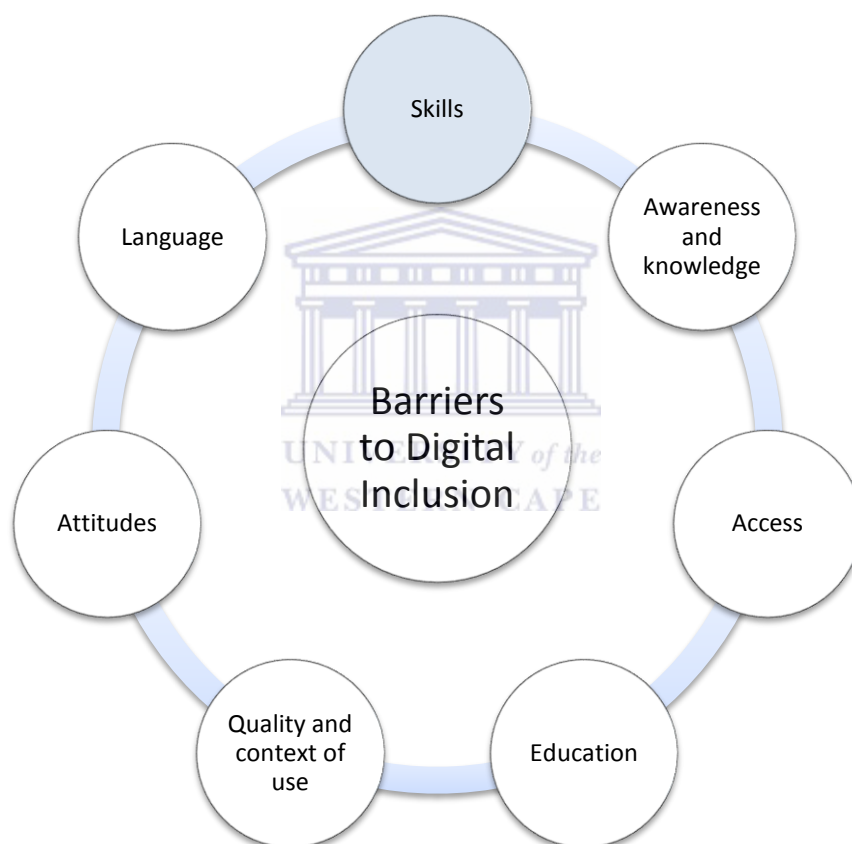


Figure 3: Literature-based barriers to Digital Inclusion (Source: Author)

There are a host of barriers to DI (and in many cases e-skills development), illustrated in Figure 3. However, this study is concerned with the current lack and development of e-skills for DI (referred to above as the focus of the study). The reviewed literature has thus far sought to gain clarity surrounding DI in hopes of gaining a better understanding of the term, in order to identify the appropriate e-skills

that would be necessary to attain it. The following section will explore these e-skills in terms of their definitions and components.

2.3 E-skills

2.3.1 Conceptualising e-skills

As a result of technological advancements, people in modern society require updated sets of skills (Selwyn & Facer, 2007). E-skills (electronic skills) is the term allocated to the broad range of skills involved in the use of ICT and is often used interchangeably with ICT or digital skills (Presidential National Commission, n.d). As with DI, the notion of being skilled is not a binary one distinguishing between those who are and those who are not but rather a continuum where some are more competent than others (Pretorius & Van Biljon, 2010). Chinien and Boutin (2011, p. 8) have referred to these digital skills as the “essential survival skills for the 21st century” and it has become generally accepted that an intricate mix of both technical and cognitive skills is required to efficiently process information in different contexts and utilise technology effectively (Chinien & Boutin, 2011; Nita, 2011).

South Africa too has recognised the essential role of e-skills as a partial solution to its socio-economic and developmental challenges (Mitrovic, Taylor, Sharif, Claassen & Wesso, 2013). To date, no universal definition of e-skills exists (Presidential National Commission, n.d). However, working on the premise that South Africans need to be equipped to participate in the labour market as well as be fully functional empowered citizens, the Department of Communication and the e-Skills Institute (2010, p. 70) have conceptualised e-skills as:

...the ability to use and develop ICTs within the context of an emerging South African Information Society and global Knowledge Economy, and associated competencies that enable individuals to actively participate in a world in which ICT is a requirement for advancement in government, business, education and society in general.

This definition highlights the areas in which an individual should be able to use e-skills to enhance his or her quality of life. The Department of Communication and the e-Skills Institute (2010, p. 2) have elaborated on these, identifying specific

dimensions for potential growth: “i) personal and educational spaces; ii) work environments; iii) community interactions; and iv) participation in and contribution to governance processes.” Due to the variety of these areas the Department of Communication and the e-Skills Institute (2010, p. 2) identified what they believed to be an extensive range of skills falling under the wide e-skills umbrella. These are listed as:

- e-Literacy skills: aimed at employment readiness, particularly targeting unemployed and unskilled youth and rural society (including starting own small business);
- e-Participation and e-Democracy skills: focusing on enhancing citizen interactive engagement with communities, local, provincial and national governance processes to increase participation, self-reliance and equity;
- e-Government/Governance skills: focusing on increasing efficiency and productivity interactive bimodal approaches to service delivery of governments and its agencies across all ICT platforms including new cell phone technology, community radio, and the like;
- e-Business skills: aimed at increasing organizational efficiency productivity;
- e-User skills: focusing on enhancing efficiency of public and private sector knowledge workers;
- e-Practitioner skills: aimed at enhancing capacity of public and private sector to manage, support and service ICT; and
- e-Community skills: aimed at increasing self-reliance, participation and community support in a socio-economic setting to build social cohesion in ways that can better build local solutions to societal matters such as crime, health, education and the like.

On closer examination, it seems that understanding these as particular situations of use rather than specific e-skills may be more appropriate and less confusing in what is already a complex subject. E-skills may then best be considered an umbrella term for skills needed in a wide range of possible scenarios by all users (Junge &

Hadjivassiliou, 2007). They are the competences required in all modern employment spaces by citizens of all ages, genders or locations, irrespective of specific job type (Department of Communication and the e-Skills Institute, 2010). These competences are defined as a combination of knowledge, skills and attitudes (see 2.3.2.3). For that reason, it is quite logical that e-skills consist of aspects as diverse as the more technical (basic to very advanced) computer skills, language competences or the thinking skills required regardless of the use of ICT (Department of Communication and the e-Skills Institute, 2010; European Commission, 2007).

DI literature and initiatives, particularly in developing countries, target marginalised groups in society and digital engagement in their daily lives (Gigler, 2004; Meyer & Muller, 2006). DI is therefore less concerned with the capabilities of advanced IT professionals, as seen in the e-practitioner skills category above, than with the ICT skills of the individual non-professional user (Junge & Hadjivassiliou, 2007). For this reason, Junge and Hadjivassiliou (2007, p. 3) prefer to concentrate on the concept of digital literacy for inclusion (see 2.3.4.5) which they believe to be the “basic functional... cognitive, critical and social capabilities” required by “the individual lay user... to participate fully in the digital society of the 21st century.”

These “individual lay user[s]” (Junge & Hadjivassiliou, 2007, p.3), “non-experts” (Romani, 2009a, p. 5), “amateurs [or] ordinary people” (Koltay & Takács, 2010, p. 6) are commonly referred to as end users and are assumed to combine technical and cognitive skills in a specific manner and context to add value in their own lives (European Committee for Standardization, 2010; Romani, 2009a). End users require the skills for different (personal, professional and academic) capacities and the context in which they utilise the skills as well as their motivations differ (European Committee for Standardization, 2010). The European e-Skills Forum distinguishes between different ICT skills, all falling within the broad e-skills umbrella. ‘ICT practitioner skills’ and ‘e-business skills’ are two of the categories that have been identified. However it is the ‘ICT user skills’ category that is of most interest as these are the end user skills required for DI. The (perhaps most widely adopted) e-skills definition for the general ICT user is:

the capabilities required for the effective application of ICT systems and devices by the individual. ICT users apply systems as tools in support of their

own work. User skills cover the use of common software tools and of specialised tools supporting business functions within industry. At the general level, they cover digital literacy: the skills required for the confident and critical use of ICT for work, leisure, learning and communication. (Korte & Hüsing, October 2010, p. 20)

2.3.2 Fundamental concepts

Before delving into more specific e-skills, it is necessary to define certain basic fundamental e-skills concepts. It is important to note that many concepts and terms are used in a number of fields and that their definition may vary according to the context or field in question (Ala-Mutka, 2011).

2.3.2.1 Literacy

Up until recently, literacy has referred to the ability to read, write and complete numerical tasks to function daily in society (UNESCO, 2008). During more recent times, it has grown to be associated with the skills and knowledge necessary to function in an increasingly digital world (Chinien & Boutin, 2011). The latter definition implies a much broader sense of the term, giving rise to many different perceptions. A modern perception of literacy in the digital world suggests that:

[L]iteracy should be seen as a continuum from instrumental skills to productive competence and efficiency. The basic skills and tools (reading/writing/mastering computer applications) must be mastered but they are only the first step in acquiring other knowledge, skills and attitudes that are built upon their usage. (Ala-Mutka, 2011, p. 22)

This notion of a continuum is vital as it would be presumptuous and irresponsible to label people as either literate or illiterate, when in fact there are many different levels of ability and multiple literacies which may be learned at various stages in life, often according to various contexts (Warschauer, 2003). The issue of context is important as is reflected in the notion of “situated literacies”, which considers the social, cultural and political contexts in which literacies are acquired and used (Richmond, Robinson & Sachs-Israel, 2008, p. 17).

2.3.2.2 Competence

Competences are a combination of knowledge, skills and attitudes appropriate to the context. The broader basis of this concept has seen it gain considerable popularity in recent times and led many to prefer it to the narrower one of skills (Ilomaki et al., 2011). Key competences are those which all individuals need for personal fulfilment and development, active citizenship, social inclusion and employment (European Commission, 2007). It is perhaps due to this complex composition of cognitive, technical and emotional aspects that competence has been identified as the most inclusive and comprehensive of the elements (Ala-Mutka, 2011). Along with the three competence components (described below), the role of context is stressed (Ilomaki et al., 2011). Romani (2009a) emphasises the importance of appropriate attitudes to applying knowledge and skills in different environments

2.3.2.2.1 Knowledge

Knowledge generally refers to our understanding of the world based on information, which we internalise through the process of learning (Ala-Mutka, 2011; Virkus, 2011). It “is the body of facts, principles, theories and practices that is related to a field of work or study” (Ala-Mutka, 2011, p. 17). The ultimate goal of knowledge, through the acquisition of information, is said to be wisdom (Carbo, 2013). In a digital competence context:

[K]nowledge includes the understanding of the functioning of main computer applications; of the risks of the Internet and online communication; of the role of technologies in supporting creativity and innovation; of the validity and reliability of online information; of the legal and ethical principles behind the use of collaborative tools. (Ferrari, 2012, p. 12)

2.3.2.2.2 Skill

Skill refers to the “*how to do*” aspect of competence (Anttiroiko, Lintilä & Savolainen, 2001; Van Deursen, 2010; Virkus, 2011). It is the ability to apply knowledge to perform a particular task (Ala-Mutka, 2011; Romani, 2009b). A distinction was made by Tissot (as cited in Romani, 2009b), between basic skills and new basic skills. The basic skills were identified as reading, writing, speaking, listening and numerical skills and were defined as the abilities necessary to function in modern society. New basic skills include “information and communication technology (ICT) skills, foreign

languages, technological culture, entrepreneurship and social skills” (Romani, 2009b, p. 17). The definition of basic skills is strikingly similar to the definition of basic literacy defined earlier. However, according to Van Deursen (2010), the new basic skills are more interactive than those related to literacy. The Internet requires much more interaction and not merely the ability to read or write. Ferrari (2012, p. 12) views the capacity to manage information as well as using the Internet and other technologies “to support critical thinking”, as examples of (digital) skills.

2.3.2.2.3 Attitude

“Attitudes’ are conceived as the motivators of performance [and] the basis for continued competent performance. They include ethics, values, and priorities ... responsibility and autonomy.” (Ala-Mutka, 2011, p. 18) Attitudes are often woven into the knowledge and skills categories and as such are generally either ignored or awarded far less attention in e-skills discussions and particularly in assessment programmes (Ferrari, 2012).

2.3.2.3 Digital Competence

Appropriation of technologies involves understanding and interacting with various ICT, which entails attitudes, knowledge and skills. (Ferrari, 2012). The following definition incorporates each of these areas, considers the context of use and provides a good understanding of the wide range of components falling under the broad term ‘digital competence’:

Digital Competence is the set of knowledge, skills, attitudes, abilities, strategies, and awareness that are required when using ICT and digital media to perform tasks; solve problems; communicate; manage information; collaborate; create and share content; and build knowledge effectively, efficiently, appropriately, critically, creatively, autonomously, flexibly, ethically, reflectively for work, leisure, participation, learning, and socialising. (Ferrari, 2012, p. 30)

2.3.3 Various terms for e-skills

The literature reveals a variety of e-skills related terms which are often used interchangeably resulting in considerable confusion. Chinien and Boutin (2011) have compiled a list of the most common terminology, all but one of which take the form of

the skill, literacy or competence concepts defined above. These are presented in Figure 4 below.

Terminology	
	21st century skills
	computer literacy
	digital competence
	digital literacy
	e-literacy
	e-skills
	generic skills
	ICT fluency
	ICT literacy
	ICT skills
	information literacy
	IT literacy
	media literacy
	multi-literacies
	new literacies
	technological literacy

Figure 4: e-Skills terminology (Source: Adapted from Chinien & Boutin, 2011)

Based on the Department of Communication and the e-Skills Institute’s (2010) definition and description of e-skills as a broad all-encompassing term, it is perhaps more accurate to view many of these terms as e-skills components, rather than synonyms as they refer to specific aspects of e-skills. The transformation of the literacy concept “from a skills focus through an applications focus towards a concern with critique, reflection, and judgement, and the identification of generic cognitive abilities or processes, or meta-skills”, helps account for overlaps between the different terms (Martin & Grudziecki, 2006, p. 253). The following are the most commonly referred to or discussed literacies within an e-skills context.

2.3.4 e-Skills for Digital Inclusion

The literature reveals certain skills and knowledge required for an individual to function in the information and knowledge economy. In the academic research setting, these abilities are increasingly termed as a particular literacy (Livingstone et

al., 2008). The following are commonly identified as the key types of literacies or skills for DI: (i) technological literacy, (ii) information literacy, (iii) media literacy, (iv) transferable skills, and (v) digital literacy. A discussion of each of these components follows, revealing the main concepts within each element as well as the difficulty in exact definitions due to conflicting expert beliefs and overlapping of skills.

2.3.4.1 Technological literacy

Often referred to as computer, IT and ICT literacy or operational skills (Van Deursen, 2010), these are the basic technical digital skills involved in using a particular ICT medium. Van Dijk (2013, p. 41) quite aptly referred to these as “button knowledge”. These basic abilities of operating various technology-based devices include processes such as working with a computer mouse, file managing or running applications (Kolding, 2007). The operation of ICT is accompanied by certain risks, making security related knowledge and skills an important and often ignored component – with potentially dangerous consequences. Lack of “security consciousness” (Lee, 2013, p. 15) and appropriate safety measures increase susceptibility to potential copyright infringement, privacy violations and cyberbullying, resulting in anything from emotional stress to financial loss (Alfreds, 2014).

Apart from merely operating ICT, the Internet brings another dimension to the equation in the form of navigational, online or Internet skills (Eshet-Alkalai, 2004; Van Deursen, 2010; Van Deursen & Van Dijk, 2008). Hargittai (2002, p. 1) defines these proficiencies very simply as “the ability to efficiently and effectively find information on the Web”. Users who lack these capacities are unable to capitalise fully on the wealth of opportunities afforded by technology. Research has illustrated that experience and time spent on the Internet directly affects navigational skills levels, while lack of these particular abilities may discourage users from future Internet activity (Hargittai, 2002). A common example of technological literacy is provided by the International Computer Driving License (ICDL), which concentrates only on the assessment of technical digital skills, largely for the goal of workplace readiness (Chinien & Boutin, 2011). An example of the ICDL skills is included in Appendix D.

2.3.4.2 Information literacy

Information skills, information empowerment, information competence and information mediacy are amongst some of the terms often used as synonyms for information literacy (Van Deursen, 2010; Virkus, 2011). This concept refers to the processes of locating, selecting, interpreting, evaluating and applying information (Lemke, 2002; Romani, 2009a; Van Deursen & Van Dijk, 2008). As is evident, information literacy cannot be said to be the result of technological advances or to be limited to the digital world: the same skills are used to retrieve sources of information from pre-ICT sources like printed newspapers (Mariën, Vleugels, Bannier & Van Audenhove, 2010). However, the impact of digital information on the current knowledge society has intensified the need for a digitally capable information literate population (Catts & Lau, 2008). Virkus (2011) and other advocates of information literacy contend that being information literate is vitally important in education, lifelong learning, employability, empowerment and other facets of civil society.

Information literacy extends beyond reading a particular text. It centres on “the ability to read with meaning, to understand critically and – importantly – to evaluate, connect and integrate different information, data, knowledge and other sources.” (Romani, 2009a, p. 8). Being able to identify and locate information sources, draw educated conclusions regarding the quality and reliability of information obtained and recognise the importance of the context in which information is to be used are all key elements of information literacy (Romani, 2009a; Vox, 2008). Romani (2009b, p. 21, 22) suggests that the two most essential aspects are: (i) *Evaluation* which reflects the ability “to make judgements about the quality, relevance, usefulness, efficiency, authority and timeliness of the information” and (ii) *Integration* which refers to “interpreting, summarising, drawing conclusions, comparing and contrasting information from multiple digital sources”. These are essential skills in what Eshet-Alkalai and Chajut (2010, p. 174) refer to as becoming “smart information consumers” at a time when the enormous amount of information is potentially overwhelming.

Information literacy definitions vary from field to field, which explains why many non-digital fields have excluded technological components, from their descriptions of the term. Koltay (2009, p. 842) suggests that an appropriate brief summary of

information literacy is “the process of recognising information need, finding, evaluating, and using information to acquire or extend knowledge”. This incorporates the widely accepted assumption that information literacy is vital for knowledge and consequently social and economic growth in the information and knowledge-based society (Van Deursen, 2010).

2.3.4.3 Media literacy

Ward (n.d.) argues that “[o]ur media ecology is a chaotic landscape evolving at a furious pace”. He offers the example that qualified journalists, once solely responsible for the information the public receive, now share this power with the public itself through social media, blogs and citizen journalism. This has resulted in differences in the nature and values of traditional and modern forms of media (Ward, n.d). Media literacy conceptualisations therefore entail “the understanding of how the traditional mass media and the digital media are merging, combining and evolving towards a new media landscape” Romani (2009a, p. 9). Citizens are required to understand the way in which the media creates meaning, the different underlying motivations for doing so and how these (often dominant) narratives presented to them, affect them personally and society at large (Romani, 2009a).

While this focus on understanding alludes to a perspective centred only on knowledge, it also encompasses cognitive related skills particularly the ability to “identify, judge and discriminate [between] media content and services” (Romani, 2009a, p. 9). Emphasis is especially placed on the role of critical thinking by the individual in relation to media content, believed necessary to distinguish between the credibility and reliability of consumed content (Helsper, 2008). Critical evaluation is viewed as a safeguard against what many perceive to be the somewhat dangerous or risky mass media (Martin, 2006). Cognitive skills, considered by some as a combination of intellectual and analytical skills, are an integral component of the concept of media literacy (Potter, 2004; Van Deursen, 2010).

The ability to access, analyse, evaluate and communicate information in both print and non-print form is central to many media literacy definitions (Martin & Grudziecki, 2006). Confusion between this concept and information literacy is therefore common and unsurprising. Many authors have considered media literacy an element of information literacy while Bawden (2008, p. 30) makes the following useful

distinction: “Information literacy implies competences in actively finding and using information in ‘pull’ mode, while media literacy implies an ability to deal with information formats ‘pushed’ at the user.” There may also be a difference in the context in which these two literacies are used. According to Livingstone et al. (2008, p. 27), information literacy applies to “employability and competitiveness in the labour market” while media literacy involves “critical appreciation, cultural participation, and resistance to dominant media”. Although this may have some merit, it could be argued that as the digital era has grown, both information and media literacy have been stretched beyond these confines and are currently used in a multitude of contexts.

Global technological development and particularly Web 2.0 have revolutionised the relationship between the media and civil society. The rise of user-generated content has removed the exclusivity once attributed to the production of media as well as the passive acceptance of ordinary citizens (Elliott, 2009). This has stimulated research to focus on both the societal consumption of media and the production and creation of content (Chinien & Boutin, 2011; Ferrari, 2012; Perlmutter et al., 2010). It has also led Lee (2013, p. 9) to refer to the general online user as a “prosumer” as opposed to a consumer of media. Understandably, some like Beetham, McGill and Littlejohn (2009) see the production of media as a branch of media literacy termed a “new media literacy” (Institute for the Future, 2011, p. 10). The overlap in categories, however, means that others such as Romani (2009) prefer to see the creation skills as falling under digital literacy. Regardless of the decision made, the emerging interactive nature of the media and the more active role of users highlight the need for informed understanding and critical evaluation of 21st century media, its role and implications.

Given that the media is a constant in the daily reality of much of the world, the ability to understand and comprehend its messages and intentions, construct meaning, critique and create media materials is necessary (Koltay & Takács, 2010; Livingstone et al., 2008). Successful achievement of these skills is said to contribute to “democracy, participation and active citizenship ... the knowledge economy, competitiveness and choice ... lifelong learning, cultural expression and personal fulfilment” (Livingstone et al., 2008, p. 3).

2.3.4.4 Transferable skills

Transferable skills are not the sole preserve of the digital sphere, but may be applied in different contexts in a variety of tasks. These general life skills allow people to participate more fully in a digital context. Although they are seldom specifically noted, they are sorely missed when absent (Helsper, 2008).

Critical thinking is widely regarded as possibly the most significant or essential of these elements, considered necessary to effectively “receive and deconstruct different kinds of content” (Lee, 2013, p. 14). As such it is often emphasised within the conceptualisation of other (media and information) literacies, highlighting the importance of this skill within the information and knowledge-based society. Chinien and Boutin (2011) include critical thinking along with problem solving, working with others and learning to learn amongst the skills, which they believe necessary for optimal performance in a workplace. Rapid changes in technology mean changes in the skills required for many to function at work; failure to adopt ‘a learning to learn’ approach and remain updated may cause professional problems (Garrido et al., 2012b). According to Selwyn and Facer (2007, p. 8) these changes in both personal and professional spaces require individuals to be reflective and adaptive in “building upon and learning from past experiences and reacting to new opportunities and circumstances”.

A lack of transferable skills may act as a barrier to engaging with technology (Helsper, 2008). The ICT training environment provides an opportunity for these very non-technical skills (which ironically keep many away from training initiatives) to be developed, often indirectly (Garrido et al., 2012b). Romani (2009b, p. 34) calls these abilities “soft skills” and encourages the use of technology “to support creativity, innovation, experimentation, problem-solving, collaborative work and critical thinking.”

2.3.4.5 Digital literacy

As already noted, there is not yet consensus on the precise definition of digital literacy (Chinien & Boutin, 2011). The literature suggests that it might be advisable to see digital literacy as an over-arching umbrella, under which the previously discussed literacies are included, since it does not strictly confine itself to any one of these (Bawden, 2008).

Merchant (2007) argues that basic literacy is a very important component of digital literacy, given the significance of reading and writing within the digital context. Basic literacy is however often ignored by many when conceptualising digital literacy. Some choose to define it purely in terms of the technical aspects involved in the use of operating ICT, while others lean heavily towards the cognitive component (Eshet-Alkalai, 2004; Junge & Hadjivassiliou, 2007).

The Perlmutter et al. (2010) prefers to take a more holistic approach to digital literacy, viewing it as a combination of three elements: (i) the skills and knowledge to use digital tools, ICT devices and applications; (ii) the ability to critically *understand* digital content and; (iii) the ability to *create* using digital technology. “Use” represents the foundation of technical skills. “Understand” may be considered the information literacy component, requiring the skills to grasp, organise and critically evaluate information. “Create” involves the ability to produce content using digital technology in order to be active participants and contributors in the information and knowledge-based society (Perlmutter et al., 2010).

The first two categories – use and understand – are perhaps older or more widely accepted concepts within a digital skills context; the creation of content and its implications is more recent. Writing, photographing, recording (Potter, 2004) and other forms of contributing material or ideas on to platforms such as the Internet, have become somewhat of ‘the norm’ in much of civil society. This adds another (growing) dimension to the digital divide, more so in developed areas, in which it has become useful to distinguish between e-skilled individuals and the quality of their ICT interaction (Hargittai, 2002). Whereas some do not progress beyond consuming existing media, others actively contribute and participate in its production. Given the pervasive nature of online material, “...those who share their content publicly have the ability to set the agenda of public discussions and debates” (Hargittai & Walejko, 2008, p. 240). These creation skills are therefore viewed as necessary “to enable individuals to respond to the content they consume and participate more effectively in the information society” (Helsper, 2008, p. 25).

Romani (2009b, p. 22) takes a similar stance in his digital literacy conceptualisation, defining it as “the proficiency to build new knowledge, based on the strategic employment of ICTs”. This view includes an “instrumental” component, being able to

retrieve information, and a “strategic” component, managing and creating new knowledge. Like the ‘use’, ‘understand’ and ‘create’ theory, it includes embedded skills such as defining, accessing, managing, creating and communicating information, and gives particular attention to critical and creative thinking (Romani, 2009b).

What is useful in this conceptualisation and perhaps what distinguishes digital literacy from others, is an emphasis on the strategic element. This is necessary to contextualise and organise information together with appropriate technology and skills and direct them in a specific way to achieve a particular goal, relevant to the individual. It is this strategic element, which allows progression from general technological use to actually attaining real, sought after benefits and “improving one’s position in society” (Van Deursen & Van Dijk, 2008, p. 3).

Eshet-Alkai (2004) has somewhat of a different view. In addition to the technical, information and creation elements, he includes ‘socio-emotional literacy’. This is the term given to understanding cyberspace etiquette and being able to apply this in the appropriate context when communicating online (Eshet-Alkalai, 2004). A more recent addition to the model is ‘real-time thinking’, which considers the ability to interact with larger amounts of information in real time – the significance of which will only increase with further technological advancement (Eshet-Alkalai, 2008).

Although these definitions and perspectives enjoy a good deal of common ground, consensus has not yet been reached. It does, however, appear that digital literacy tends to focus increasingly more on cognitive than technical aspects, with particular emphasis on critical thinking and evaluation (Junge & Hadjivassiliou, 2007; Martin & Grudziecki, 2006). The following definition provides quite a fitting summary of the digital literacy discussion:

Digital Literacy is the awareness, attitude and ability of individuals to appropriately use digital tools and facilities to identify, access, manage, integrate, evaluate, analyse and synthesize digital resources, construct new knowledge, create media expressions, and communicate with others, in the context of specific life situations, in order to enable constructive social action; and to reflect upon this process. (Martin, 2006, p. 19)

In order to fully understand the e-skills for DI, it is necessary to draw on the literature to locate these skills within appropriate frameworks.

2.4 A review of e-skills related frameworks or models

It is evident that a wide range of skills, literacies and competences are considered necessary for the effective use of ICT for inclusion in the digital era and information and knowledge society. It is not surprising, given this broad range, that it is difficult to reach agreement on the appropriate skills for DI, as is evident in the previous discussion and in the following review of frameworks or models. These frameworks range from being rather broad – including more general life competences – to narrow, focusing exclusively on ICT related elements. The various components draw on the fundamental concepts (i.e. skills, literacies, competences or combinations of these), and vary depending on the views of the creators. Most frameworks aim to identify the digital skills, literacies and competences considered necessary for effective functioning and inclusion in modern society, while some are geared towards a more specific purpose, e.g. digital skills within the work environment. Brief descriptions of the origin, perspective or purpose of each framework are provided followed by the listed components.

2.4.1 Australian Digital Communications Literacy Framework

The Australian Communications and Media Authority has designed a digital literacy framework in which digital communications literacy is defined as “the skills and capabilities needed for effective participation in the digital economy and to encourage social inclusion in a networked society” (Osborne, 2010, p.2). These skills are recognized as:

Table 1: Australian Digital Communications Literacy Framework (Source: Osborne, 2010)

Digital Communications Literacy	
Skills	Definitions
<i>Use</i>	Use ICT infrastructure, devices and the information skills to find content and services
<i>Understanding and interpretation</i>	The ability to understand, evaluate and control aspects of media content, to judge the quality and authority of sources and trust in

Digital Communications Literacy	
Skills	Definitions
	various online media forms
<i>Creation and participation</i>	The ability to participate in social media; and contribute to user generated content, e.g., to post to a blog, or forum
<i>Consumer protection/security</i>	Understanding online security risks and how to protect oneself and those one is responsible for

2.4.2 Bloom's Digital Literacy Framework

The framework created by Bloom (1956) focuses on information processing and cognitive abilities and categorises and orders “thinking skills”. His framework was later revised by multiple theorists. In more recent years Churches (2009) felt that an adapted version of Bloom's taxonomy should be applied to ICT in education and training (Chinien & Boutin, 2011). The following table illustrates Bloom's (higher to lower) ordered thinking skills and their definitions. It is supplemented with modern examples of each category, provided by Churches.

Table 2: Bloom's Digital Literacy Framework (Source: Chinien & Boutin, 2011; Churches, 2009)

Digital Literacy		
Key Concepts	Definitions	Churches' modern examples
<i>HOTS: Higher Order Thinking Skills</i>		
<i>Creating</i>	Designing, constructing, planning, producing, inventing, devising, making	Programming, filming, animating, blogging, video-blogging, mixing, wiki-ing, publishing, podcasting, directing/producing
<i>Evaluating</i>	Checking, hypothesising, critiquing, experimenting, judging, testing, detecting, monitoring	Commenting, reviewing, posting, moderating, collaborating, networking, refactoring
<i>Analysing</i>	Comparing, organising, deconstructing, attributing,	Mashing, linking, tagging, validating

Digital Literacy		
	outlining, finding, structuring, integrating	
<i>Understanding</i>	Interpreting, summarising, inferring, paraphrasing, classifying, comparing, explaining, exemplifying	Searches, blog journaling, categorising, commenting, subscribing
<i>Remembering</i>	Recognising, listing, describing, identifying, retrieving, naming, locating, finding	Bullet-pointing, highlighting, bookmarking,
<i>LOTS: Lower Order Thinking Skills</i>		

2.4.3 Canadian Digital Literacy Framework

The Canadian Media Awareness Network proposed a model of digital literacy, stating that three verbs define a digitally literate individual: use, understand and create (Perlmutter et al., 2010). The descriptions of these three seemingly simple elements reveal that the framework includes the basic technical, information processing, creation and communication skills, as well as what could be considered somewhat higher level abilities found in some of the other reviewed frameworks.

Table 3: Canadian Digital Literacy Framework (Source: Perlmutter et al., 2010)

Digital Literacy	
Task	Description
<i>Use</i>	The technical fluency needed to engage with computers and the Internet. This skill set forms the basis for deeper digital literacy development. Essential technical skills include the ability to use computer programs such as word processors, web browsers, e-mail, and other communication tools. In order to develop these skills, Canadians must have access to and be comfortable utilizing equipment and knowledge resources such as broadband services, computers, software tools, Internet search engines, and online databases.
<i>Understand</i>	The ability to comprehend, contextualize and critically evaluate digital media. Canadians should be aware of the importance of critical evaluation in understanding how digital media content and applications can reflect, shape, enhance or manipulate our perceptions, beliefs, and feelings about the world around us. A critical understanding of digital media enables individuals to reap

Digital Literacy	
Task	Description
	the benefits – <i>and</i> mitigate the risks – of full participation in the digital society. This skill set also includes the development of information management skills and an appreciation of one’s rights and responsibilities in regards to intellectual property. In a knowledge economy, Canadians need to know how to find, evaluate, and effectively use information to communicate, collaborate and problem-solve in their personal and professional lives.
<i>Create</i>	The ability to create content and effectively communicate using a variety of digital media tools. Creation with digital media means more than the ability to use a word processor or write an email: it includes the ability to adapt communication to various contexts and audiences; to create and communicate using rich media such as images, video, and sound; and to effectively and responsibly engage with Web 2.0 user-generated content such as blogs and discussion forums, video and photo sharing, social gaming, and other forms of social media. The ability to create with digital media ensures that Canadians are not just passive consumers but active contributors to the digital society.

2.4.4 Canadian Digital Skills in the workplace

This framework has emphasised the need to view digital skills within the workplace as a multidimensional subject and identified skills under four main clusters. Although slightly differently labelled, each cluster almost exactly correlates with the previously discussed basic literacy, information literacy, technological literacy and transferable skills concepts (see 2.3.4). Unlike most frameworks included in this section, this model is directly focused on skills needed in a work environment. As can be seen, however, its components largely overlap with other frameworks which have aimed to identify more general digital skills for various contexts.

Table 4: Canadian digital skills in the workplace (Source: Chinien & Boutin, 2011)

Digital Skills in the workplace	
Core skills	Sub-sets of skills
<i>Foundational Skills</i>	Reading, writing, oral communication, document use and numeracy
<i>Transversal Skills</i>	Thinking/problem-solving, continuous learning/work with others
<i>Digital Technical Skills</i>	Use software applications

Digital Skills in the workplace	
Core skills	Sub-sets of skills
	Use digital systems and tools
	Apply security measures in digital environments
<i>Digital Information Processing Skills</i>	Determine information needs: Recognize, define and articulate digital information needs
	Access information: Locate, select and retrieve digital information
	Organize information: Decode, restructure and classify digital information to facilitate storage, retrieval and use
	Integrate information: Interpret, analyse, summarize, compare and contrast, combine, repurpose and represent digital information
	Assess information: Judge the quality, relevance, usefulness, validity and applicability of digital information
	Apply information: Use information of various digital formats effectively and efficiently to perform job tasks
	Create information: Generate new digital contents and knowledge by organizing, integrating, adapting and applying digital information
Communicate information: Share digital information with others at work	

2.4.5 DigEuLit Project

This European model aims to define digital literacy. In this instance, it is viewed as a combination of information, media, visual and ICT related literacies (Ferrari, 2012). It is designed as a three-level structure, the first of which is digital competence, consisting of the necessary skills and attitudes. The second level is digital usage, which is the utilisation and application of digital competence in specific contexts. The final and highest level is digital transformation. This occurs when digital usage leads to creativity, innovation and some form of substantial impact (Ferrari, 2012; Martin & Grudziecki, 2006). The following diagram illustrates the model and its three levels:

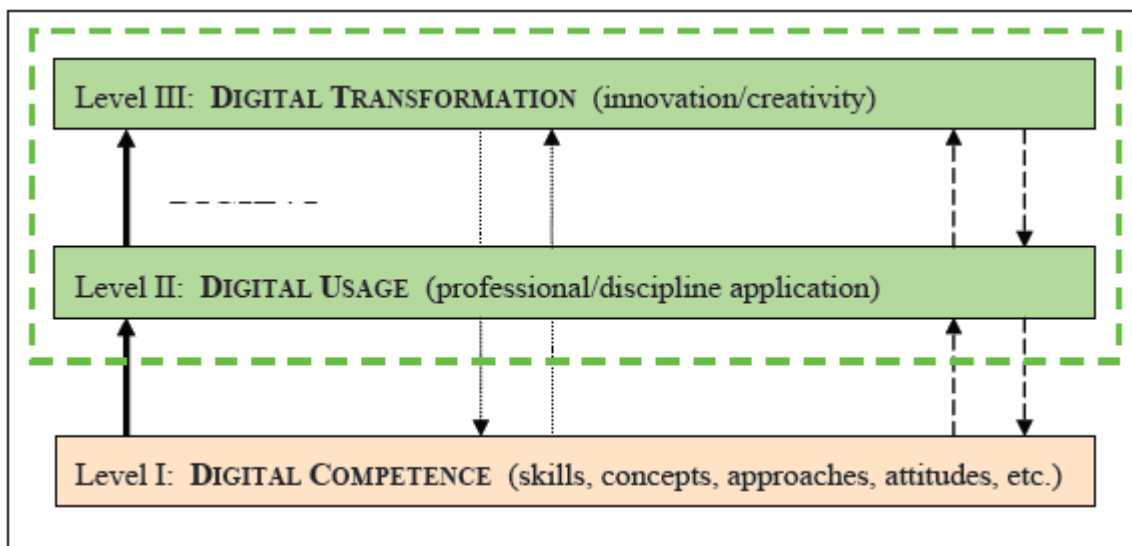


Figure 5: DigEuLit Project (Source: Martin & Grudziecki, 2006)

Since the focus of this section is on specific skills, literacies or competences, the first level – digital competence – is of particular value in understanding what exactly is required in reaching the third level of digital transformation. Digital competence, according to this perspective, consists of thirteen processes of varying complexity (Martin & Grudziecki, 2006). These are presented in Table 5.

Table 5: DigEuLit Project - Digital competence (Source: Martin & Grudziecki, 2006)

Digital competence	
Process	Descriptor
<i>Statement</i>	To state clearly the problem to be solved or task to be achieved and the actions likely to be required
<i>Identification</i>	To identify the digital resources required to solve a problem or achieve successful completion of a task
<i>Accession</i>	To locate and obtain the required digital resources
<i>Evaluation</i>	To assess the objectivity, accuracy and reliability of digital resources and their relevance to the problem or task
<i>Interpretation</i>	To understand the meaning conveyed by a digital resource
<i>Organisation</i>	To organise and set out digital resources in a way that will enable the solution of the problem or successful achievement of the task
<i>Integration</i>	To bring digital resources together in combinations relevant to the

Digital competence	
Process	Descriptor
	problem or task
<i>Analysis</i>	To examine digital resources using concepts and models which will enable solution of the problem or successful achievement of the task
<i>Synthesis</i>	To recombine digital resources in new ways which will enable solution of the problem or successful achievement of the task
<i>Creation</i>	To create new knowledge objects, units of information, media products or other digital outputs which will contribute to task achievement or problem solution
<i>Communication</i>	To interact with relevant others whilst dealing with the problem or task
<i>Dissemination</i>	To present the solutions or outputs to relevant others
<i>Reflection</i>	To consider the success of the problem-solving or task-achievement process, and to reflect upon one's own development as a digitally literate person

2.4.6 Digital Competence Framework

This framework was developed in an effort to identify the key knowledge, skills and attitudes of digital competence, considered necessary for learners of all levels. Ferrari (2012) acknowledges that further revision and adaptation to suit more specific target groups may be beneficial.

Table 6: Digital competence framework (Source: Ferrari, 2012)

Digital Competence	
Competence Area	Description
<i>Information Management</i>	Identify, locate, access, retrieve, store and organise information
<i>Collaboration</i>	Link with others, participate in online networks and communities, interact constructively
<i>Communication and sharing</i>	Communicate through online tools, taking into account privacy, safety and netiquette
<i>Creation of content and knowledge</i>	Integrate and re-elaborate previous knowledge and

Digital Competence	
Competence Area	Description
	content, construct new knowledge
<i>Ethics and responsibility</i>	Behave in an ethical and responsible way, aware of legal frames
<i>Evaluation and problem-solving</i>	Identify digital needs, solve problems through digital means, assess the information retrieved
<i>Technical operations</i>	Use technology and media, perform tasks through digital tools

2.4.7 Digital Competence Model

This conceptual model focuses on the knowledge, skills and attitudes necessary to achieve digital competence. The first category consists of the more basic technical abilities required to use digital tools or devices, including understanding the purpose, limitations and risks of the medium. The more advanced competence components are the key areas of application referring to the: “ability to apply digital tools and media for specific tasks; strategic skills for benefiting from digital environments [and]; integration of these digital aspects in digital environments for one’s own daily life and objectives” (Ala-Mutka, 2011, p. 48). Unlike many others, this framework pays significant attention to attitudes, which are considered integral due to their role in the motivation to engage with technology. Figure 6 presents the central elements within the framework.

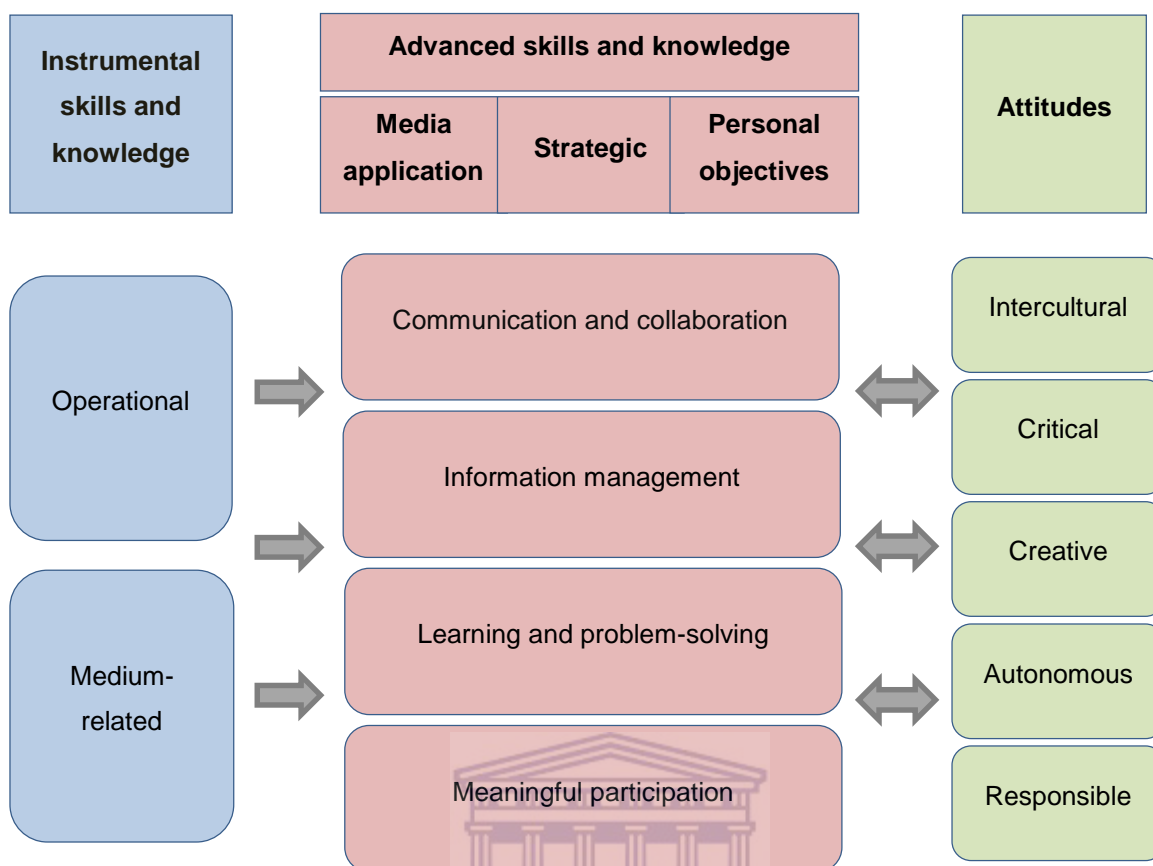


Figure 6: Digital competence model (Source: Adapted from Ala-Mutka, 2011)

2.4.8 Digital literacy model

Bawden (2008) proposed a model of digital literacy based on four factors. Embedded in these are basic literacy and technical digital skills; knowledge surrounding the nature of information and resources; competences relating to the management of digital information and formats and; attitudes and perspectives to assist in learning what is necessary in one's own context and in being responsible in dealing with technology (Bawden, 2008).

Table 7: Bawden's digital literacy model (Source: Bawden, 2008)

Digital literacy	
Main Elements	Sub-components
<i>Underpinnings</i>	Literacy Computer/ICT literacy
<i>Background knowledge</i>	The world of information Nature of information resources

Digital literacy	
Main Elements	Sub-components
<i>Central competences</i>	Reading and understanding digital and non-digital formats Creating and communicating digital information Evaluation of information Knowledge assembly Information literacy Media literacy
<i>Attitudes and perspectives</i>	Independent learning Moral/social literacy

2.4.9 International Digital Literacy: A conceptual framework for survival skills in the digital era

Considering digital literacy as a “survival skill” in modern society, Eshet-Alkalai (2008) has deconstructed the concept to identify what is believed to be the encompassed technical, cognitive, sociological motoric and emotional skills. Initially the model consisted of photo-visual literacy, reproduction literacy, information literacy, branching literacy, and socio-emotional literacy (Eshet-Alkalai, 2004). Real-time thinking was a later addition.

Table 8: Digital Literacy - A conceptual framework for survival skills in the digital era (Source: Eshet-Alkalai & Chajut, 2010; Eshet-Alkalai, 2008)

Digital Literacy	
Literacy concept	Description
<i>Photo-visual literacy</i>	Read, understand and use information displayed in visual and graphical formats. This unique form of digital thinking skill helps users to intuitively “read” and understand instructions and messages that are presented in a visual-graphical form, as in user interfaces and in children’s computer games.
<i>Reproduction literacy</i>	Create new meanings from different pieces of information

Digital Literacy	
Literacy concept	Description
	gleaned. Modern digital technologies provide users with opportunities to create visual art and written works by reproducing and manipulating text, visuals, and audio pieces. This requires the utilization of a digital reproduction thinking skill, defined as the ability to create new meanings or new interpretations by combining pre-existing, independent shreds of digital information as text, graphic, and sound.
<i>Information literacy</i>	Make educated and smart use of information. Today, with the exponential growth in available information, consumers' ability to assess information by sorting out subjective, biased, or even false information has become a key issue in training people to become smart information consumers.
<i>Branching literacy</i>	Create knowledge with randomly acquired information. In hypermedia environments, users navigate in a branching, non-linear way through knowledge domains. This form of navigation confronts them with problems that involve the need to construct knowledge from independent sources of information that were accessed in a non-orderly and non-linear way.
<i>Socio-emotional literacy</i>	Share emotions by means of digital communication tools. Users of collaborative digital environments, such as knowledge communities, discussion groups, and chat rooms, are required to employ sociological and emotional skills in order to perform effectively in the mass communication of the cyberspace.
<i>Real-time thinking skill</i>	Present-day multimedia environments, such as simulations and games, require that users process simultaneously large volumes of stimuli that bombard their cognition repeatedly. The ability of users to perform effectively in these environments is termed "real-time thinking".

While most of these components are very similar to those identified in other frameworks, a few are not. Socio-emotional literacy for example is largely ignored in most e-skills literature. However, given the increasingly social nature of digital platforms and digital interaction, it is plausible that these "sociological and emotional skills" (Eshet-Alkalai & Chajut, 2010, p. 174) will become as essential online as in traditional forms of communication. The most recent addition – real-time thinking – is even more rare within e-skills discussions. Eshet-Alkalai (2008, p. 3220) proposes that in interacting with certain multimedia environments, users "...have to quickly and

effectively synchronize the chaotic multimedia stimuli into one coherent body of knowledge” and respond. Real-time thinking is very often associated with simulations and digital games. However, it is not limited to the use of ICT; it may be observed in tasks as common as driving a vehicle (Eshet-Alkalai, 2008). Eshet-Alkalai sees real-time thinking as particularly significant in the digital realm and considers that it will become even more so with the advances in technology.

2.4.10 Netherlands Internet Digital Skills Framework

This model of Internet digital skills was created by Jan van Dijk and is based on “*basic digital technical skills, cognitive and metacognitive skills and, situated literacy perspectives*” (Chinien & Boutin, 2011, p. 23). The framework consists of four skills clusters, which increase in complexity namely, operational skills, formal skills, informational skills and strategic skills.

Table 9: Netherlands Internet Digital Skills Framework (Source: Van Deursen & Van Dijk, 2008)

Internet Digital Skills	
Skills	Descriptions
<i>Operational Skills</i>	The skills used to operate computers and networks e.g. using Internet browsers, search engines and forms.
<i>Formal Skills</i>	The skills to comprehend the specific structure of a digital medium, particularly navigational skills. Whereas older forms of media were more linear and the user did not have much control over the flow of information, more modern mediums like the Internet are non-linear and can lead the user in many different directions leading to disorientation.
<i>Informational Skills</i>	The ability to locate, select, evaluate and use the needed information effectively.
<i>Strategic Skills</i>	The capacity to use computer and network sources as the means for particular goals and improving one’s position in society. This is achieved by: <ul style="list-style-type: none"> • An orientation towards a particular goal; • Taking the right action to reach this goal;

Internet Digital Skills

Skills

Descriptions

- Making the right decision to reach this goal;
- Gaining the benefits belonging to this goal

2.4.11 Romani 21st century literacies and e-competencies

Romani's (2009b) model has chosen to work with the term "*e-competent user*" referring to someone capable of combining specific ICT with appropriate skills and knowledge. Five key e-competencies are defined as:

a set of capabilities, skills and abilities to exploit tacit and explicit knowledge, enhanced by the utilization of digital technologies and the strategic use of information. E-competencies go beyond the use of any specific ICT, including the proficient use of information and the application of knowledge to work individually and collaboratively in changing contexts. (Romani, 2009a, p. 43)

Table 10: Romani: 21st century literacies and e-competencies (Source: Romani, 2009a)

21st century literacies and e-competencies

e-Competence

Definition

e-Awareness

This cognitive (thinking) skill is characterized by a user's awareness of ICTs and appreciation of the relevance of these ICTs in the information based society. It is the capability to understand and adopt the lifelong-learning paradigm and the use of ICTs as a medium to facilitate the individual or collective development of knowledge, skills and new capabilities in both social and professional life. This understanding of the human, cultural, and societal issues related to technology and their practice also includes legal and ethical behaviour (digital citizenship).

Technological literacy

The confident and critical use of electronic media for study, work, leisure and communication. It is represented by the ability to interact with hardware and software, as well as productivity applications, communication devices and management applications. The technologies involved in this definition evolve according to the technological transformation (currently this includes tools such as: mobile phones; computers; Internet; cameras, among other digital devices). The ability to use these tools can be acquired in a formal environment like schools or informal ways (self-learning).

21st century literacies and e-competencies

e-Competence	Definition
<i>Informational literacy</i>	<p>The ability to understand, assess and interpret information from all kinds of sources. Reading with meaning. In an environment where users are overloaded with information being able to analyse, judge, evaluate and interpret information and placing it in context becomes a crucial skill.</p> <p>Two very important abilities related to the information literacy are <i>evaluation</i> (reflecting to make judgements about the quality, relevance, usefulness, efficiency, authority and timeliness of the information) and <i>integration</i> (interpreting, summarizing, drawing conclusions, comparing and contrasting information from multiple digital sources).</p>
<i>Digital literacy</i>	<p>The proficiency to build new knowledge, based on the strategic employment of ICTs. The main aspects related to digital literacy are: how to get relevant information (<i>instrumental dimension</i>) and how to manage and produce new knowledge (<i>strategic dimension</i>). Some of the skills related to digital literacy are: <i>definition</i> (using ICT tools to search, find, identify and recognize the information need); <i>access</i> (knowing how to collect and/or retrieve information in digital environments, and the ability to develop a search strategy to locate information from one or more sources); <i>management</i> (organizing information into one or more classification schemes); <i>creation</i> (generating new information and knowledge by adapting, designing, editing, inventing, or representing information in ICT environments) and <i>communication</i> (conveying information and knowledge to various individuals and/or groups).</p>
<i>Media literacy</i>	<p>Understanding how the traditional mass media and the digital media are merging towards a new media landscape. Some of the related skills and knowledge are based on the comprehension of how media work, how they are organized, how they are evolving to new formats, platforms and ways of communication and interaction and, finally, the understanding how and why they produce meaning (construct reality) as well as the social, legal, economic and political implications of that. Includes an informed and <i>critical viewing</i> or <i>critical analysis</i> of the media's nature</p>

2.4.12 UNESCO: Digital Literacy Framework

The following framework was developed by the United Nations Educational Scientific and Cultural Organization (UNESCO) in an effort to identify indicators to measure information literacy amongst its member states (Catts & Lau, 2008). Due to the broad range of skills covered in this model, such as basic technical digital skills, multiple literacies, cognitive and metacognitive skills and, situated literacy

perspectives, the term digital literacy may be better suited than information literacy (Chinien & Boutin, 2011).

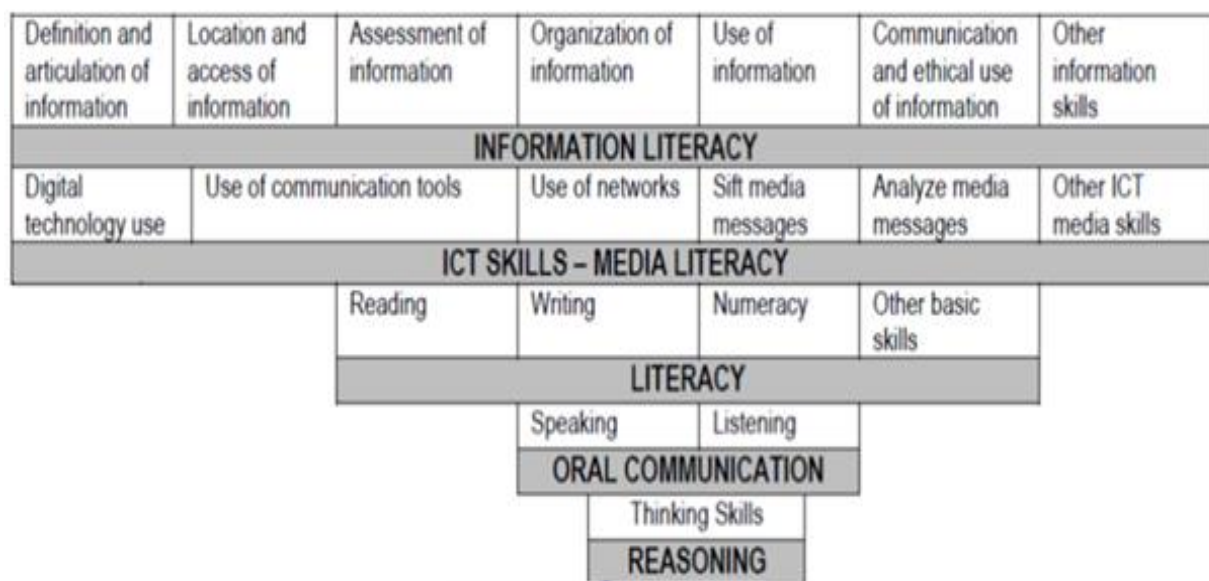


Figure 7: UNESCO Digital literacy framework (Source: Chinien & Boutin, 2011; Catts & Lau, 2008)

2.4.13 Vox Competence Goals

Vox (2008) - the Norwegian Institute for Adult Learning – has based its competence framework on the premise that the basic skills of literacy, numeracy and digital competence were the essential fundamental basis for additional learning and were lacking in society. The framework is composed of the four areas of: (i) digital competence; (ii) numeracy; (iii) reading and writing and; (iv) oral communication. It is aimed at adults for functioning in both personal and employment capacities (Vox, 2008).

Table 11: Vox Competence Goals Framework (Source: Vox, 2008)

Competence Goals		
Competence goal	Sub-objectives	
<i>Digital competence</i>	Using ICT systems	The use of digital tools and services for specific everyday tasks; acquire the skill of selecting appropriate tool for appropriate context
	Searching for	Ability to identify, retrieve and process information

	and exchanging information	from various source
	Production and presentation of information	Ability to produce and present information in a manner which is relevant to recipients; requires an understanding of the appropriateness of digital tools in different contexts and ability to adapt the presentation of digital information to the specific context and recipient
<i>Numeracy</i>	Competent with numbers, measurements and basic statistics	
<i>Reading and writing</i>	Basic reading, writing, understanding and textual communicating strategies	
<i>Oral Communication</i>	Listening, responding, speaking and communicating strategies	

The discussion of skill, literacy and competence concepts as well as the review of frameworks provides a foundation on which to build and identify e-skills for DI. Figure 8 presents the central e-skills, literacies and competences for DI identified through this literature, followed by a more detailed description in Table 12. Given the wide variation between sources regarding the specific terminology of elements and discrepancies in conceptualisations (of what may often appear to be identical skills), summarising these abilities is an intricate and somewhat subjective task. The following compilation is therefore structured according to the central themes and categories of e-skills for DI in the various frameworks, with the utmost effort made to include each element into an appropriate category.

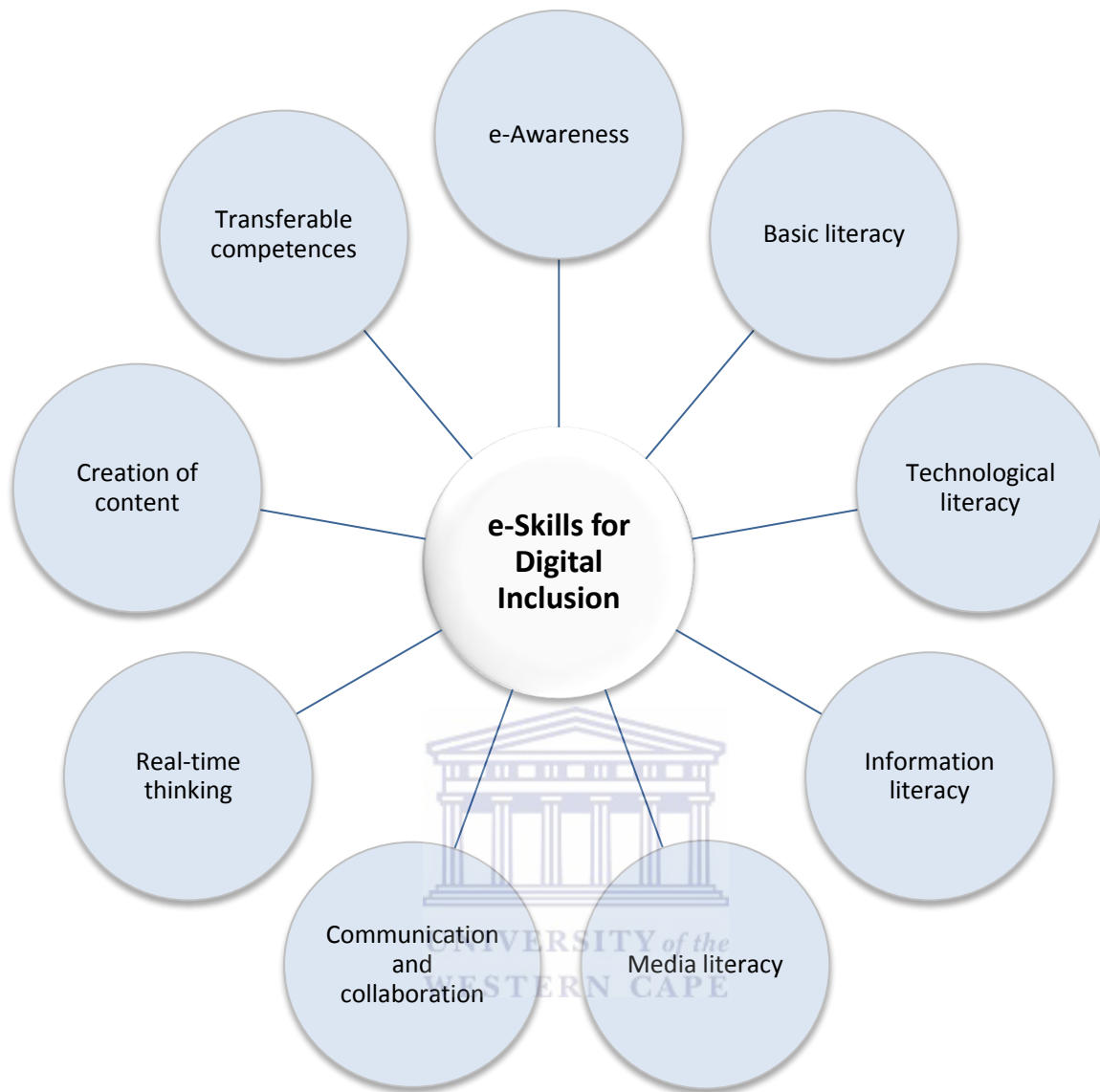


Figure 8: Literature-based e-skills for digital inclusion (Source: Author)

Table 12: Compilation of literature-based e-skills (Source: Author)

e-Skills for Digital Inclusion		Description	References
e-Awareness	Technology	Aware of various ICT and how these may potentially be (economically, socially, politically, health, civic and culturally) beneficial for the individual and society. Understanding of the human, cultural, and societal issues related to technology	Bianchi et al., 2006; Romani, 2009a
	Information	Aware of the abundance and value of information and the nature of information resources	Bawden, 2008
	Privacy, safety, legal and ethical issues	Aware of legal and ethical issues in digital media and the safety risks which accompany the use of technology	Ala-Mutka, 2011
Literacies	Basic literacy	Basic competences in reading, writing and numeracy	Bawden, 2008; Chinien & Boutin, 2011; European Commission, 2007; Lemke, 2002; Vox, 2008
	Technological Literacy	<i>Operational skills</i> Interact with hardware, software, networks and various ICT devices, understanding the context and purpose of use	Ala-Mutka, 2011; Chinien & Boutin, 2011; Ferrari, 2012; Romani, 2009a; Van Deursen & Van Dijk 2009

e-Skills for Digital Inclusion		Description	References
	<i>Navigation skills</i>	Navigate through a medium to obtain specific information. Particularly related to Internet navigation and the ability to find relevant information within a non-linear structure	Eshet-Alkalai & Chajut, 2010; Hargittai, 2002; Van Deursen, 2010; Van Deursen & Van Dijk 2009
	<i>Security skills</i>	Apply security measures in digital environments to minimise risk	Chinien & Boutin, 2011; Osborne, 2010
	Information literacy	Understand and assess information from all kinds of sources: Identify, access, organise, evaluate, interpret, analyse, synthesise and apply information	Ala-Mutka, 2011; Bawden, 2008; Chinien & Boutin, 2011; Eshet-Alkalai & Chajut, 2010; Ferrari, 2012; Livingstone et al., 2008; Romani, 2009a; Van Deursen & Van Dijk 2009
	Media Literacy	Understand how the traditional mass media and the digital media are merging, combining and evolving towards a new media landscape. Ability to deal with content 'pushed' at the user, in a variety of digital and non-digital formats	Bawden, 2008; Livingstone et al., 2008; Romani, 2009a
Communication and collaboration		Speak, listen, present and convey digital information and knowledge to others; communicate and interact through online tools; participate in online networks; convey emotion through digital platforms; work as part of a team	Ala-Mutka, 2011; Bawden, 2008; Chinien & Boutin, 2011; Eshet-Alkalai & Chajut, 2010; Ferrari, 2012; Martin & Grudziecki, 2006; Romani, 2009a

e-Skills for Digital Inclusion	Description	References
Real-time thinking	Process and respond to large volumes of different stimuli simultaneously and very quickly, which is particularly important in modern multimedia environments (e.g. simulations and games)	Eshet-Alkalai, 2008; Eshet-Alkalai & Chajut, 2010
Creation of content	Contribute to user-generated content by integrating and re-elaborating previous content and knowledge to construct new digital content by organising, integrating, editing, adapting, designing, inventing, applying or representing digital information	Ala-Mutka, 2011; Chinien & Boutin, 2011; Churches, 2009; Eshet-Alkalai & Chajut, 2010; Ferrari, 2012; Perlmutter et al., 2010; Osborne, 2010; Romani, 2009a
Transferable competences	Broad range of non-technical skills and attitudes: Critical thinking, problem-solving, sense-making, learning to learn, adaptability, self-regulation, responsibility, reflection, creativity, cultural awareness and strategic thinking	Ala-Mutka, 2011; Chinien & Boutin, 2011; European Commission, 2007; Ferrari, 2012; Livingstone et al., 2008; Martin & Grudziecki, 2006; Van Deursen & Van Dijk, 2008

A thorough e-skilling for DI strategy, however, should not consist merely of necessary skills but should also focus on the manner in which they are delivered. Significant aspects of approaches in the delivery of e-skills are considered in the following section.

2.5 Approach to the delivery of e-skills for Digital Inclusion

To date, e-skills training initiatives have received considerably less attention than those focused on providing access to ICT infrastructure and connectivity. Literature has gradually begun to emphasise the importance of training, specifically when targeting socially excluded groups and this has led to the proposal that community access initiatives be consistently accompanied by (preferably free) skills training (Foley et al., 2002). The wide range of e-skills programmes make the success factors in approaches difficult to identify. Nevertheless, examining these approaches is imperative. While certain issues are generally agreed upon, others are more controversial. This chapter provides a brief overview of the main strategies in current initiatives by exploring the relevant literature. It should be noted that the scope of this research only allows for discussion of a few of the key aspects.

2.5.1 Face-to-face, online and blended learning

There has been an overwhelming amount of support for face-to-face skills training, because of the importance of human social interaction in the learning process (Bradbrook & Fisher, 2004). Given the highly varied factors influencing people, not everyone is able to learn in a purely online environment, without appropriate human interaction and assistance (Haché, 2011). For instance, introducing technologies without the personal contact and support of a teacher or peer has proved to be relatively ineffective in developing country contexts. For some, the social experience of the face-to-face setting is as beneficial as the actual ICT skills. This is evident in cases such as immigrant women who improved their social skills, extended their networks and gained confidence in their own learning capacities (Garrido et al., 2012b). This may be the reason that some experts or authorities prefer face-to-face approaches, arguing that these training environments should be used to promote networking between participants and encourage the sharing of ideas (Romani, 2009a).

Online learning on the other hand, may be more convenient in modern times where people can learn in their own time, space and location. As already stated, however, the lack of social interaction and personal support has had negative consequences in cases where many require human intervention in learning (Haché, 2011). Loneliness and lack of motivation have been listed as other potentially negative factors in this approach (Precel, Eshet-Alkalai & Alberton, 2009). In addition, language and communication may be a large factor militating against online learning: trainees who are unable to understand often need human help. Trainers or facilitators in a face-to-face setting are in a good position to clear up misunderstandings or control discussion of particularly controversial subjects (Stanton, 2006). More pressing concerns, however, are the lack of cognitive skills which are required to engage effectively with (particularly online) technology (Precel et al., 2009) and the actual access to ICT in many developing countries (Stanton, 2006). These factors have contributed to the growing trend to use blended learning in ICT training initiatives. This integrates online learning with face-to-face techniques, and includes both group and individual learning methods (Garrido et al., 2012b; Kluzer et al., 2011; Precel et al., 2009).

2.5.2 Formal, informal and innovative approaches

E-skills training initiatives have gradually shifted focus from very structured formal to more flexible informal learning methods (Romani, 2009a). Formal and informal are commonly used interchangeably for face-to-face and online learning. However, formal does not always imply face-to-face and informal does not necessarily mean online. Elkjaer, Høytrup and Pedersen (2007, p. 23) distinguish between formal and informal approaches in the following manner:

Formal learning is defined as what happens in planned teaching or counselling activities in formal educational institutions where learning is the explicit goal. Informal learning is learning that takes place outside these arenas and as an integral part of (or sometimes a side-effect of) everyday work activities. Some researchers further distinguish between informal and incidental learning, where incidental learning is learning that arises as a byproduct of other activities. Incidental learning is not intentional, while informal learning can be intentional.

Informal learning techniques therefore most commonly include skills picked up during interactions with family and friends, self-learning or learning by means of trial and error (Romani, 2009b). Fear, embarrassment or negative attitudes have led many to avoid formal initiatives, intensifying the need for more informal approaches (Bradbrook & Fisher, 2004; Hellowell, n.d). The homeless, as well as the elderly are examples of groups who generally prefer these more laidback and non-threatening learning spaces (Bradbrook & Fisher, 2004). Less structured approaches are, however, not always effective. This is evident in Ala-Mutka's (2011, p. 19) observation that "some knowledge and skills (tool and medium-related) can be developed through experience and self-learning, while other aspects (strategic and cognitive) require education and guidance". This perspective does not disregard people's capacity to acquire certain skills on their own to meet their own needs. However, it stems from a concern not to undermine the importance of teachers, trainers and education. In support of this Ala-Mutka (2011), reported that while self-learning may increase technical ICT skills, structured education refines the broader cognitive and strategic thinking abilities. Therefore, self-learning has a clear role in ICT training, but that does not diminish the value of structured teaching.

Existing NGOs and other organisations tackling various inclusion issues have successfully used informal methods to attract the excluded (Bianchi et al., 2006). Many DI initiatives have attempted these less formal routes by basing themselves in informal settings within the particular targeted community to reach those most in need of assistance (Seale, 2009). Informal learning techniques tend to focus more on gaining interest and showcasing exciting aspects of technology and how these may be personally useful (Selwyn & Facer, 2007). These methods are largely aimed at socially and digitally excluded groups who do not generally wish to continue learning through formal ICT training courses (Bradbrook & Fisher, 2004; Seale, 2009). Most ICT training approaches still remain formal (Bradbrook & Fisher, 2004).

E-skills training now includes more than the traditional teacher-students scenarios, adopting innovative yet less used methods such as training-the-trainer, peer learning and intergenerational learning (Junge & Hadjivassiliou, 2007). Training-the-trainer has become popular in ICT initiatives, with many projects opting to enlist those already actively involved in working with marginalised groups (e.g. youth workers),

as ICT trainers in community centres (Zinnbauer, 2007). Although useful, this strategy has proved problematic in many projects where trainers are inadequately trained, often resulting in failed initiatives (Sikute & Mensah, 2010). Trainers (or volunteers, should this be the case) must be competent and their skills must be constantly updated (Bradbrook & Fisher, 2004). Simultaneously, it must be noted that while they may have digital skills, they may not possess the pedagogical skills to teach in a manner that really assists the learning process and encourages further learning (Mariën et al., 2010). Garrido et al., (2012a, p. 99) are amongst more recent authors to discuss the “emerging evidence that the skill of a formal knowledge worker might be not so much that they provide help to users, but that they can read when users need help and when they want to be left to their own devices”. Youth workers or those already working with marginalised groups are more likely to have these pedagogical skills than general volunteers are. Another difficulty affecting African trainers in particular is that many do not own a personal computer and are left without access outside of working hours, which may be unproductive (Sikute & Mensah, 2010). However, these adverse factors have been overcome by initiatives that have successfully adopted train-the-trainer approaches. It is important for projects to encourage these trainers – particularly the volunteers – to use their skills to better themselves professionally (Bradbrook & Fisher, 2004).

Peer learning is another technique which may be effective in overcoming cultural barriers for those who find it easier to relate to someone similar to themselves. Younger people may relate better to someone their own age, while peer learning is particularly useful in training certain women who are only comfortable being taught by other females (Casacuberta, 2007). Certain projects targeting the elderly use older trainers as they recognise that many older people prefer this, feeling less insecure about their lack of skills and ability to interact with ICT (Bradbrook & Fisher, 2004).

Intergenerational learning, another face-to-face technique, adopts a different approach. It uses younger digitally literate people – the “digital native generation” (Ala-Mutka, 2011, p. 21) – to teach and include older citizens. Certain structured initiatives send the youth out to organisations such as old age homes but informal processes such as school children teaching a grandparent (or even a parent) how to

operate an ICT device, may be equally successful. These forms of learning not only develop digital skills in trainees but also leadership skills in trainers and “research shows that intergenerational activity ... offers heightened learning for both the youth and adults, increases self-confidence, increases cross-generational comfort levels, eliminating stereotypes that each generation may hold for the other” (Kolodinsky, Cranwell, & Rowe, 2002, Introduction section, para. 5).

2.5.3 Focused target groups

A big debate in ICT training approaches revolves around targeting specific groups versus delivering training indiscriminately to the general broad population. The latter “blanket approach” (Casacuberta, 2007, p. 2) tends to teach the same general ICT skills regardless of differences in skill levels or personal characteristics (Casacuberta, 2007). There is much greater support for the perspective that different skills and literacies need to be provided to different groups (Koltay & Takács, 2010). An initiative which targets a specific group has different objectives from blanket approaches because it focuses on the particular needs of different groups (Garrido et al., 2012b). This tailoring may differentiate between those interested in improving ICT skills for information, entertainment or professional purposes (Koltay & Takács, 2010) and see advanced users as probably requiring more specific skills as opposed to the basic ICT skills taught to beginners (Haché, 2011). Many DI projects do not reach the excluded who in fact require the most attention. By purposefully targeting and pursuing specific groups – in this case those most in need of inclusion efforts - this is less likely to be the case (Bianchi et al., 2006). It is often difficult for this kind of tailoring to take place and even more complicated to distinguish between abilities, which are often self-reported and in many cases either exaggerated or underestimated. Although specific groups are still preferred, trainers should be prepared to work with groups with very mixed abilities and expectations (London School Of Economics And Political Science LSE, 2009).

2.5.4 Tailored and contextualised initiative

Approaches should be tailored to suit the particular context of the initiative (Haché, 2011). This does not imply a complete movement away from existing successful ICT training projects but rather an adaptation to meet the realities of the specific place and people at whom the project is aimed (Junge & Hadjivassiliou, 2007). Van

Reijswoud (2009) believes that the culture, environment, political climate, organisation and economy of the country or region must be considered when tailoring an initiative and that the project should always be adapted to suit the context and not vice versa. Contextual tailoring is particularly valuable in a developing country context. The relatively young field of ICT is only beginning to grasp the concept of appropriate technology according to Van Reijswoud. Many ICT initiatives in developing countries simply replicate strategies of developed areas (e.g. Europe, America) without considering the vast socio-economic, cultural and ICT deployment differences (Bianchi et al., 2006; Van Reijswoud, 2009). Direct emulation of first world methods or projects has rarely proved effective in developing countries (Avgerou, 2003). According to Van Reijswoud (2009, p. 3),

technologies have a good chance to be effective if they are appropriate to the needs, expectations and limitations of the surroundings in which they will be applied. In other words, the selected solution should be in harmony with local standards and values and build on existing skills and techniques.

As Bradbrook & Fisher (2004, p. 4) note: "Initiatives that attempt to provide ICT for its own sake are less likely to succeed." ICT training strategies aimed at DI should emphasise the integration of "real-world problems" (Romani, 2009b, p. 33) and "non-digital knowledge equally important to social inclusion" within the approach (Casacuberta, 2007, p. 5). In the case of a group or community where there has been little or no interest in ICT engagement or the acquisition of e-skills, addressing a personal or community interest is much more likely to catch the target's attention (Bradbrook & Fisher, 2004). Training initiatives should consider the daily needs of their students and what tools or skills would be practical and useful in their own realities (Bianchi et al., 2006; Bradbrook & Fisher, 2004; Selwyn & Facer, 2007). Successful initiatives should first gain an understanding of the "meaningful activities" of a specific group of people and then design the course involving the digital tools and skills which will enable maximum functioning of these activities (Martin, 2009, p. 12). Addressing the "Why should I learn this?" question (Institute for Innovation in Learning, 2010, p. 8) and using real life examples and tasks allow people to understand why digital skills can be personally important to each of them. A report from The Economist Intelligence Unit (2013, p. 24) suggests that "[a] website just

doesn't cut it—it has to be something robust, like renewing a car registration online ... Once services are in place, it is just a matter of raising awareness of them". Strategies such as these are thought to attract new users and allow them to understand the personal meaning in skills development (Martin, 2009). This has proved particularly effective in introducing social media to the elderly or very socially excluded and isolated groups, allowing them convenient contact (Helsper, 2008).

A vital factor in tailoring initiatives is considering relevant content and learning material. Some initiatives use off-the-shelf material, while others develop their own or alter existing curriculums. This latter option may be particularly suited to third world countries (Garrido et al., 2012b; Mariën et al., 2010). People are attracted to personally relevant content so ICT training courses need to consider this for those unfamiliar with ICT, as well as more advanced users who will soon lose interest in what they perceive to be irrelevant material (Media Alliance, 2007). For similar interest/field groups, successful ICT training courses tend to relate the content to what is specifically relevant to those individuals, e.g. digital training for new University students focusing on content related to familiarisation with the specific university, courses, writing skills, plagiarism, databases and reading material etc. (University Of Edinburgh, 2009). For more general groups, generic information is the key. This may be related to a variety of subjects, from employment and health to entertainment, preferably concerning the local settings (Media Alliance, 2007). This provides an opportunity for user content to be generated in the form of online discussions (chat rooms, discussion forums and social media) regarding these local issues (Media Alliance, 2007). User-generated content is more likely to draw more members of excluded groups through the social interaction it promotes (Bradbrook & Fisher, 2004).

2.5.5 Multi-stakeholder approach

Lack of communication and collaboration between DI initiatives targeting the same vicinity are an unnecessary waste of time, resources and often counterproductive (Bradbrook & Fisher, 2004; Van Reijswoud, 2009). There is increasing awareness of the necessity for co-ordinated strategies and joint multi-stakeholder approaches, especially in large scale projects (Bianchi et al., 2006; Bradbrook & Fisher, 2004). Depending on the scope of the project, stakeholders may include government,

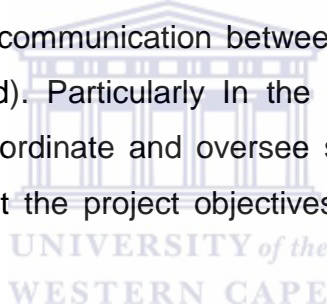
education, business and civil society along with a host of other interested parties who contribute specific expertise, resources and experience. The concern with “things being done ‘to the people’ rather than ‘with the people’” (Heeley & Damodaran, 2009, p. 9) in many DI initiatives, has led to an emphasis on viewing the community itself as the primary stakeholder (Van Reijswoud, 2009). It has thus become widely accepted that for e-skills initiatives to be successful, the real needs of communities must be understood. This entails actively including and treating target groups as experts on local issues (Bianchi et al., 2006; Heeley & Damodaran, 2009). In addition, involving these citizens in the initial phases of project design (e.g. through round-table discussions and workshops) is a useful means of obtaining local support – vital to the success and sustainability of the initiative (Madon, Reinhard, Roode & Walsham, 2009; Van Reijswoud, 2009). Project developers are encouraged to recognise the target group’s ability to steer and define their own developmental needs and objectives, before outsiders enter and decide these on their behalf (Gigler, 2004).

Although often overlooked, intermediaries, whether in the form of NGOs, local organisations or a respected and knowledgeable community member, are equally valuable stakeholders. They are closer to the target groups, often more trusted than foreign organisations and therefore likely in a better position to reach, motivate and provide a support base to excluded groups (Haché, 2011; Heeley & Damodaran, 2009). Intermediaries are particularly useful in deep rural areas, where mistrust and suspicion of outsiders’ motives are likely (Madon et al., 2009). In addition, they are able to assist outsiders in understanding local culture, traditions and identify and gain the approval of influential community leaders (Gigler, 2004). Intermediaries are thus an important link between the target groups on the one hand and the government, private sector and other stakeholders, on the other (Bianchi et al., 2006; Heeley & Damodaran, 2009).

While these bottom-up approaches are clearly valued, they are not without challenges, which have been evident in the absence of top-down government strategies. Besides the threat to sustainability caused by issues such as insufficient funding and a lack of thoroughly researched strategies, it is difficult to identify and document the reasons for success and failure of smaller grass-roots programmes or

which groups are being reached. Furthermore, the precise conceptualisation and intentions of these initiatives are not clear (Mariën et al., 2010). An integration of top-down and bottom-up approaches is probably best, capitalising on the advantages of each and the contributions of all stakeholders (Bianchi et al., 2006).

Multi-stakeholder approaches are complex because of the wide range of personalities, opinions, biases and objectives, which may influence the project outcomes (Garrido et al., 2012b; Gigler, 2011; Heeley & Damodaran, 2009). However, when properly implemented, such an approach is an excellent means of integrating a wide range of knowledge, facilities, funding and other resources. It is imperative that clear lines of communication exist between all parties with vested interests and that a common goal and implementation strategy are agreed to by all involved. Clear strategies are extremely important, particularly in e-skills projects operating at a regional or even national level. Many failures are a result of poorly developed strategies and miscommunication between the project design and local implementation (Hellawell, n/d). Particularly in the case of larger initiatives, it is advised that a central unit coordinate and oversee stakeholder relations, ensuring efficient collaboration and that the project objectives translate at the ground level (Bradbrook & Fisher, 2004).



2.5.6 Learner-centred approach

A focus on the learner is strongly emphasised in ICT training initiatives. This includes considering the needs of every individual in the implementation phase (Institute for Innovation in Learning, 2010). It includes ensuring that all learners are able to keep up by taking account of differences in attention span and learning pace. It also involves using a variety of teaching approaches such as the use of small groups and step-by-step instructional strategy, providing personal one-on-one coaching where needed and respecting the differences in knowledge learners have when they enter the programme (Institute for Innovation in Learning, 2010; Mariën et al., 2010). Choices relating to the size of the group are less clear cut. Sometimes decisions have to be made “between reaching larger numbers of people in quicker and less intensive ways and reaching smaller groups of people in slower and more extensive ways” (Warschauer, 2003, p. 201). This is often true of many funded social development ventures. However, it is of absolute importance that the needs of the

learners are not compromised. The techniques chosen must increase the likelihood of excluded groups participating, completing training and having an overall better learning experience (Mariën et al., 2010).

“[G]iving more educational ‘authority’ to the learner as to what to learn, how to learn and when to learn” (Sikute & Mensah, 2010, p. 4) may enrich his or her experience. It also acknowledges that the learner has valuable opinions on his or her skilling and it creates the opportunity for these opinions to be given appropriate attention (Institute for Innovation in Learning, 2010). Other ways of making the activities more learner-centred is to include planning and reflection in them and to offer regular, punctual feedback on progress (Beetham et al., 2009).

The Institute for Innovation in Learning (2010) advocates that trainers should reduce the initial fear and apprehension of learners. Throughout the programme, they should simplify instructions and explanations as much as possible to ensure learners understand. They should reassure learners, be empathetic to their needs and struggles and steer clear of terminology which may confuse those unfamiliar with ICT. Trainers need interpersonal skills, such as the ability to be friendly and approachable so they can put learners at ease and create a productive learning environment (Bradbrook & Fisher, 2004). These strategies, as well as other factors related to effective approaches that were discussed earlier, are illustrated in Figure 9. **Error! Reference source not found.** below.

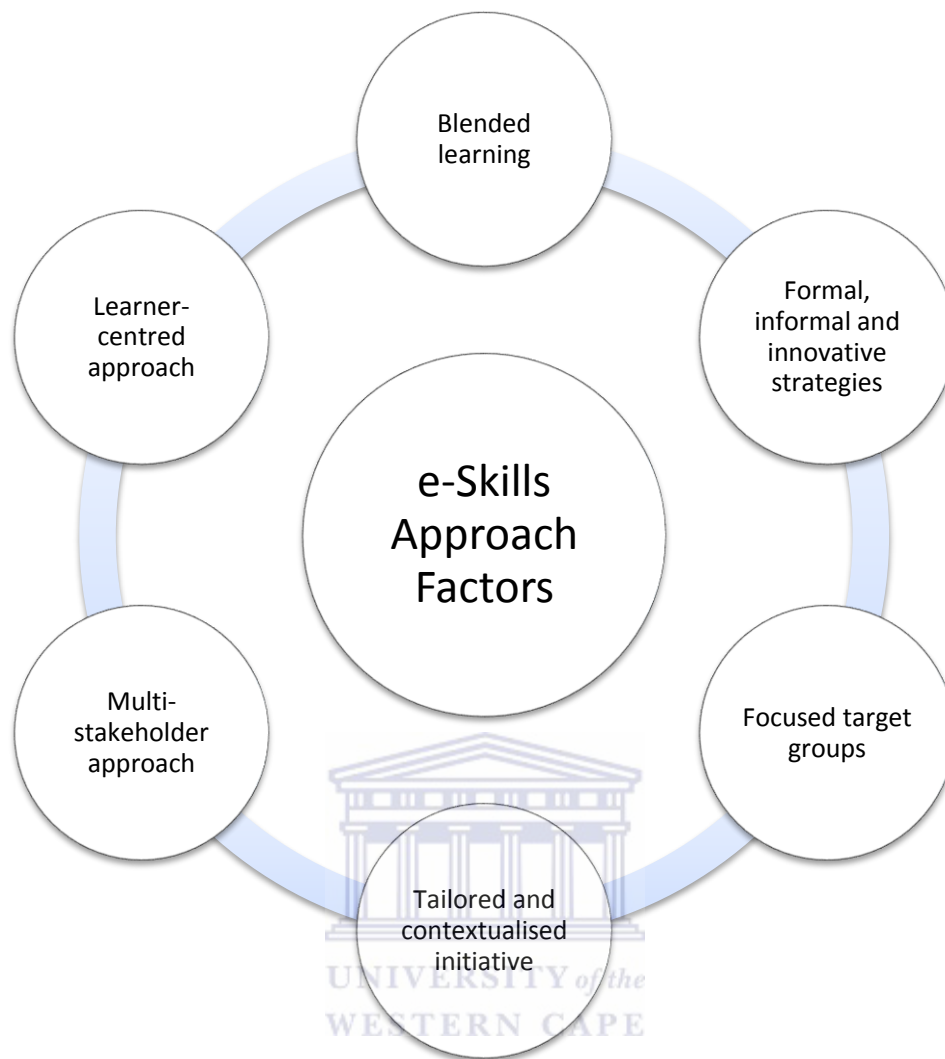


Figure 9: Literature-based e-skills approach factors (Source: Author)

2.6 Summary of the reviewed literature

This chapter concludes with a summary of the reviewed literature. A brief discussion of the key literature-based findings relating to DI, e-skills for DI and e-skills delivery approaches are presented. This is followed by a graphic representation of the proposed model, illustrating these central concepts as well as the process involved in their relation to each other.

2.6.1 Digital Inclusion, e-skills and delivery approaches – Key findings

DI is a multifaceted concept. On the surface, it is concerned with providing people with access to ICT and the skills to function effectively in the information and knowledge-based society. The most basic concern of DI is enabling the marginalised groups of society to use these resources for personally relevant purposes and

benefits. These marginalised categories generally coincide with the typically digitally excluded groups, particularly the socially and economically excluded, rural and geographically remote communities, linguistic and ethnic minorities, females and groups with special needs and impairments. The main barriers to DI include a lack of awareness and access to ICT, poor levels of education, inefficient use of technology, language difficulties and negative attitudes towards ICT engagement.

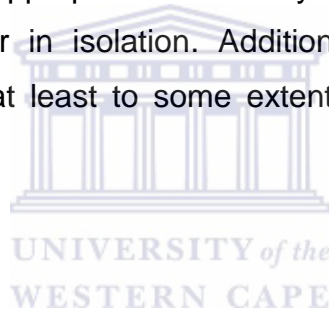
In broad terms, DI is concerned with gradually changing the behavioural patterns of these groups to improve their lives to some extent and alleviate the problems that disadvantaged communities face. It is therefore closely linked to social disadvantage and ultimately strives to utilise ICT to achieve important developmental goals, particularly the elimination of social inequalities. DI aims to increase (social, cultural, economic, civic, health or political) participation in society and work towards the empowerment and social inclusion of marginalised groups, and to create an information and knowledge-based society.

Discussions on DI have increasingly shifted to the crucial role of e-skills. These abilities are considered essential to function effectively in the information and knowledge-based society and achieve the objectives of DI discussed in this chapter. The e-skills necessary for DI are at times referred to as end user and ICT user skills, or, more commonly in recent times, digital literacy and digital competence. The latter is perhaps more comprehensive as it implies a combination of knowledge and attitudes along with skills. Reaching consensus on the specific skills needed for DI is difficult. Where these were previously limited to technical operating proficiencies, they now increasingly include more complex cognitive abilities, including what may be considered as more general life skills.

The literature also revealed certain guidelines for the delivery of these e-skills, which are thought to increase the likelihood of success of DI initiatives. Blended learning is currently the preferred approach. This combines face-to-face and online methods as well as group work and individual accountability. Given that many excluded groups shy away from formal learning institutions, DI projects should include more informal avenues to attract their interest and build confidence.

More innovative strategies, such as train-the-trainer, peer teaching and intergenerational learning can be used to vary the approach. Other important approach factors include: targeting specific groups; contextualising the initiative to suit the culture, environment, political climate and economy of the targeted area; adopting a multi-stakeholder approach; considering the relevance of the implemented skills and technology to the needs of the target group; using local and relevant content and; adopting a learner-centred approach.

Based on the literature, this research adopts the perspective that DI is essential for optimal functioning in an information and knowledge-based society. This requires the acquisition of specific ICT user skills, generally referred to by the umbrella term, e-skills. DI is vital for digitally excluded groups – usually the marginalised members of society. Figure 2.10 illustrates the transition from digital exclusion to digital inclusion through the development of appropriate e-skills by means of particular strategies. This process does not occur in isolation. Additional barriers to DI have to be addressed and overcome – at least to some extent – during the movement from digital exclusion to optimal DI.



2.6.2 Literature-based framework: Towards the development of e-skills for Digital Inclusion

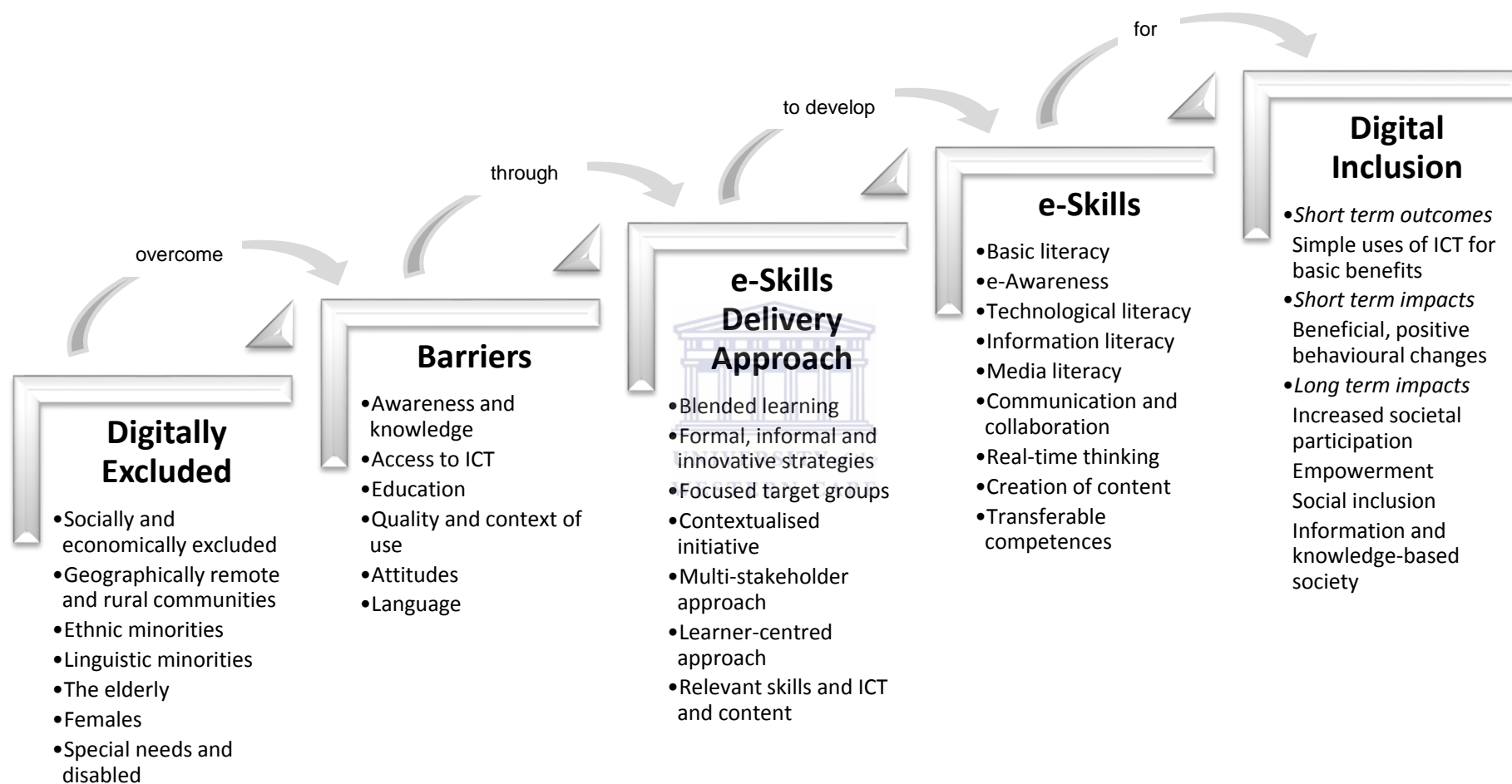


Figure 10: Literature-based conceptual framework (Source: Author)

CHAPTER 3: RESEARCH DESIGN AND METHODOLOGY

3.1 Introduction

This research attempted to clarify the complex issues related to DI and e-skills as well as their delivery approaches, particularly within the WC of South Africa. In order to do so, the empirical investigation has focused on an on-going initiative in this province, in which managers or staff members of various community e-centres across the WC are being provided with e-skills training at the e-Skills Knowledge Production and Coordination CoLab situated at the University of the Western Cape (UWC). This chapter describes the research design, methodology and methods used in this study.

3.2 Research Design

The research design illustrates the strategy and specific steps from the conceptualisation phase, to data collection and analysis and finally to the development of an appropriate framework. According to De Vaus (2001, p. 9), "The function of a research design is to ensure that the evidence obtained enables us to answer the initial question as unambiguously as possible." It is "a blue-print or a detailed plan of how a research study is to be conducted" (De Vos & Fouche, 1998, p. 123). The design is concerned not so much with how to carry out the plan but rather why. De Vaus (2001) illustrates this by describing how builders do not blindly begin to construct a building, but first devise an appropriate work plan based on the specific requirements of the project. The design has to be distinguished from the methods to be employed and fundamentally serves as a guideline informing the researcher in identifying relevant data to collect, and the manner in which to analyse the results (McCaston, 2005). The research design of this specific study involved the steps illustrated in Figure 11:

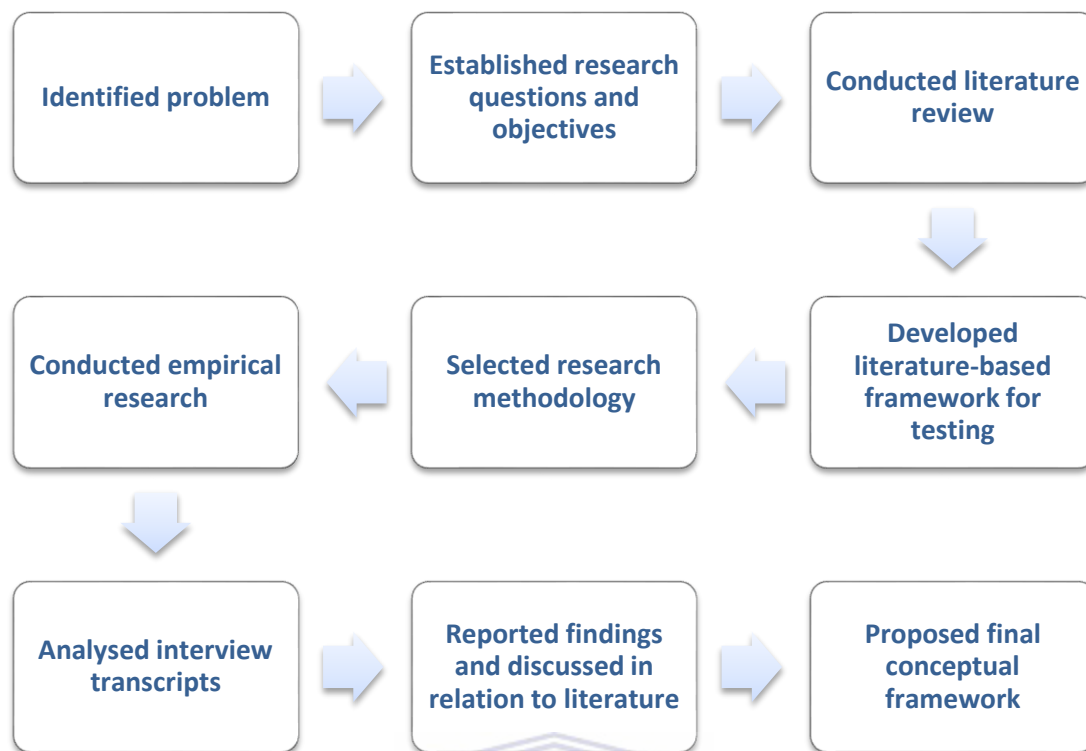


Figure 11: Research design (Source: Author)

During the process of this investigation, the researcher:

1. Identified the research problem

The problem chosen was meaningful and affected the priorities and developmental goals of WC society. The lack of knowledge of the nature of necessary e-skills for DI and appropriate approaches to deliver them in the South African context created an opportunity to build on existing research to address a pertinent challenge currently facing the country.

2. Established the research questions and objectives

The research problem guided the development of the main research question. This was divided into sub-questions which were refined so that they appropriately addressed the key aspects of the problem under investigation. The researcher then created specific objectives that the study needed to meet in order to offer solutions to the problem in question and contribute to knowledge. During the course of this study, the research questions and objectives were used as constant guide to ensure that all information gathered and every step taken was directly related to the achievement of a specific objective.

3. Conducted a comprehensive literature review of DI, relevant e-skills and pertinent approach factors to the delivery of e-skills

In order to develop a sound knowledge base on the subject matter, the literature on DI, e-skills and significant approach factors to e-skills delivery was reviewed. In an effort to properly address the main research question, the literature review was directed by each of the three sub-question issues.

4. Developed a literature-based conceptual framework for testing

The reviewed literature revealed international understandings of DI, the broad range of skill sets needed to achieve DI and the significant approach factors related to the delivery of these skills. The DI conceptualisations, as well as the delivery approach factors, were summarised and the central e-skills from the various literature models and frameworks were re-grouped and compiled into a table of 'e-skills for DI'. A framework informed by the relevant literary work was then developed encompassing each of these – DI, e-skills for DI and e-skills delivery approach – elements and their relation to one another, to be tested in empirical research.

5. Selected the case study methodology within the qualitative paradigm to test the conceptual model

Various research methodologies were investigated and the relevance and applicability of each of these to this particular study were carefully considered. Based on the nature of the study and the research questions guiding it, the decision was made to choose interpretivism, a qualitative approach and case study methodology. Each of these is discussed in 3.3.2.

6. Conducted data collection

The sample consists of thirteen participants who were selected using purposive sampling and the criteria described in 3.3.2.3. Semi-structured, face-to-face interviews were conducted with these participants and recorded. These recordings were later transcribed. Observation of training, seminars and the examination of the CoLab documents also generated data.

7. Conducted analysis of empirical data

The data were analysed according to the method of constant comparison an element of Grounded Theory. Similarities and patterns between transcripts from different

interviewees were sought, as well as between empirical data and the reviewed literature. The analysis techniques as well as their applicability to this study are described in 3.3.2.5.

8. *Reported empirical findings and discussed in relation to literature*

The patterns and trends revealed through data analysis are reported in Chapter 4, which includes the findings related to all three sub-questions on DI, e-skills and delivery approaches. In this report, these findings are simultaneously compared and discussed in relation to the literature review. This allows readers to gain an understanding of the pertinent factors under investigation and the development of the final conceptual model.

9. *Proposed a final conceptual framework and practical recommendations*

The final conceptual framework is presented, which is based on international literature and refined with knowledge from the empirical data to fit the needs of WC communities. The framework includes each of the three researched aspects: DI, e-skills for DI, and pertinent e-skills approach factors. The knowledge and findings inherent in this framework enabled the researcher to make recommendations into e-skills for DI initiatives in the WC.

3.3 Research Methodology

3.3.1 Philosophical perspective

The philosophical perspective underlying a research methodology may be described as the set of assumptions or underpinnings which inform the research, including the choice of methodology and justification of the selections made (Crotty, 1998; Levy, 2006). This is sometimes referred to as the theoretical perspective, which Crotty (1998, p. 3) defines as: “the philosophical stance informing the methodology and thus providing a context for the process and grounding its logic and criteria.” These perspectives reflect the way in which we understand the world, how we perceive reality (ontology) and how knowledge and meaning is constructed (epistemology) (Crotty, 1998; Travis, 1999). According to Krauss (2005, pp. 758, 759), “[O]ntology involves the philosophy of reality, epistemology addresses how we come to know that reality while methodology identifies the particular practices used to attain knowledge of it.” The selected research methods are thus highly dependent on these

understandings and underlying philosophical assumptions (Travis, 1999). The dominant philosophical perspectives or paradigms at present are positivism and interpretivism. The assumptions that underlie each of these are outlined in Table 13 below:

Table 13: Characteristics of positivism and interpretivism (Source: Carson, Gilmore, Perry & Gronhaug, 2001)

	Positivism	Interpretivism
Ontology		
<i>Nature of 'being'/ nature of the world</i>	Have direct access to real world	No direct access to real world
<i>Reality</i>	Single external reality	No single external reality
Epistemology		
<i>'Grounds' of knowledge/ relationship between reality and research</i>	Possible to obtain hard, secure objective knowledge	Understood through 'perceived' knowledge
	Research focuses on generalization and abstraction	Research focuses on the specific and concrete
	Thought governed by hypotheses and stated theories	Seeking to understand specific context
Methodology		
<i>Focus of research</i>	Concentrates on description and explanation	Concentrates on understanding and interpretation
<i>Role of the researcher</i>	Detached, external observer	Researchers want to experience what they are studying
	Clear distinction between reason and feeling	Allow feeling and reason to govern actions
	Aim to discover external reality rather than creating the object of study	Partially create what is studied, the meaning of phenomena

	Strive to use rational, consistent, verbal, logical approach	Use of pre-understanding is important
	Seek to maintain clear distinction between facts and value judgements	Distinction between facts and value judgements less clear
	Distinction between science and personal experience	Accept influence from both science and personal experience
<i>Techniques used by researcher</i>	Formalized statistical and mathematical methods predominant	Primarily non-quantitative

As is evident from the above, positivism is concerned with factual, measurable findings, which can be generalised to a similar context (Kus, 2003; Travis, 1999). It is based on the assumption that only one reality exists and functions irrespective of our knowledge or consciousness of it. The research strives to be objective and independent of the researcher, who should distance him/herself to such an extent as to have no influence on the outcomes or findings (Hussey, 1997; Ritchie & Lewis, 2003; Travis, 1999). Positivism tends to be a scientific approach, which largely relies on standard and structured principles, observes relationships between variables, commonly makes use of statistical procedures and is highly concerned with the reliability and validity of the research (Hussey, 1997; Kus, 2003; Ritchie & Lewis, 2003; Travis, 1999).

As with most theories, positivism is not without criticism. Mack (2010, p. 7) questions “the certainty that one can apply a methodology used to research a natural science to research a social science”. Criticism surrounding this aspect of positivism led to the development of interpretivism, which Immanuel Kant in 1781 saw as being based on the following assumptions (Ritchie & Lewis, 2003, pp. 6,7):

- Perception relates not only to the senses but also to human interpretations of what our senses tell us.

- Our knowledge of the world rests on ‘understanding’ which arises from thinking about what happens to us, not just simply from having had particular experiences.
- Knowing and knowledge transcend basic empirical enquiry.
- Distinctions exist between ‘scientific reason’ (based strictly on causal determinism) and ‘practical reason’ (based on moral freedom and decision-making which involve less certainty).

Interpretivism is grounded in the subjective nature of reality and takes the perspective that we socially construct our own meaning, which will differ from one individual to the next. In this sense the researcher and research are interrelated, as “You cannot divorce yourself from your perspective as the researcher” (Mack, 2010, p. 8). The interpretivist perspective pays particular attention to the contextual factors surrounding the way people perceive reality and seeks to understand behaviour from the targeted individual’s personal perspective. This results in multiple, rather than the assumed single, reality in positivism (Mack, 2010). It is influenced by the phenomenological paradigm, which strongly promotes personal and subjective interpretations of reality (Hussey, 1997; Mack, 2010; Travis, 1999). The role of the researcher is therefore to “understand, explain, and demystify social reality through the eyes of different participants” (Cohen, Manion & Morrison, 2007, p. 19). Interpretivism has been criticised for its lack of generalisability, given its movement away from the exact sciences observed in positivism. While generalising is not as simple in an interpretivist paradigm, Williams (2000) argues that it is not impossible and is largely inevitable; however, it is more speculative and tentatively presented. Those in support of this paradigm also believe that assigning a strict structured research design does not allow for deeper understanding, which is largely the goal of studies of this nature; and statistical methods used in positivism are likely to overlook relevant and unexpected findings (Hussey, 1997). The complex subject matter of this research and the need to obtain complex information based on subjective perceptions of those that have received or provided e-skills training makes interpretivism the appropriate choice for this study.

3.3.2 Methodology selection

There is some confusion as far as the term “methodology” is concerned. Mingers (2001) explains that the term refers to the specific research methods used in a particular study. This implies that methodologies vary from one study to the next. The methodology is therefore broader than a particular method and relates to: “(i) why you collected data; (ii) what data you collected; (iii) from where you collected it; (iv) when you collected it; (v) how you collected it and; (vi) how you will analyse it”. (Hussey, 1997, p. 54). A distinction is commonly made between qualitative and quantitative methodological approaches, and the selection is determined by the nature of the study and research questions (Levy, 2006). While quantitative methodologies are normally based on positivist perspectives, “by its nature, interpretivism promotes the value of qualitative data in pursuit of knowledge” (Kelliher, 2005, p. 123). For this reason, this investigation has adopted a qualitative methodology.

3.3.2.1 Qualitative methodology

The main objective of this study was to gain conceptual clarity on DI, the relevant e-skills to attain it, and to draw up recommendations on a suitable approach to be used in developing e-skills for DI in the WC. This required in-depth conversations with relevant individuals involved both on the supply and receiving end of the training, gaining insight into their views. Since there was (i) a high level of subjectivity involved in investigating the complex issues surrounding e-skills and DI; (ii) the need to ensure contextual relevance and; (iii) the focus on drawing rich quality and in-depth information from the perspective of the participants, a qualitative research design was used (Hussey, 1997). A qualitative approach provides an opportunity to gain insight into the perceptions of the participants of the e-skills training process, whereas a quantitative approach is likely to offer only a surface view. According to Seale (2009), qualitative approaches are generally best suited to DI-related studies because of the intricate and context-based nature of the subject matter.

Traditional approaches to formal research focused on obtaining specific measurement and quantifiable variables (Tesch, 2013). The need to obtain a deeper understanding of complex phenomena and behaviour led to the development of qualitative research, which has not always been well received, even being labelled

as “soft, unscientific, atheoretical, without substance... [and] ‘touchy-feely’ messing about” (Anzul, Ely, Freidman, Garner & McCormack-Steinmetz, 2003, p. 102). It has since gained firm support, with many demonstrating its value. Research of this kind is concerned with quality and depth of understanding, complex data, and making sense of phenomena (Leech & Onwuegbuzie, 2007). Unlike quantitative methodology, qualitative research is subjective because it aims at gaining insight into the personal perceptions of individuals in order to contribute to understandings of human behaviour and social contexts (Hussey, 1997). This approach focuses on natural settings and the unfolding of behaviour without manipulation. It also involves interaction between the researcher and the participants in order to gain deeper meaning of the stories and views of the subjects. The findings regarding specific phenomena should be applicable to similar contexts or compare favourably with the findings of studies on similar subject matter in comparable contexts (Golafshani, 2003). The importance of the relationship between researcher and participants is illustrated in the following significant premises of qualitative research:

[F]ace-to-face interaction is the fullest condition of participating in the mind of another human being, understanding not only their words but the meanings of those words as understood and used by the individual, and (2) that one must participate in the mind of another human being in order to acquire social knowledge. (Lofland & Lofland, 1996, p. 16)

Qualitative research acknowledges that biases may occur within research and reports these in findings. This approach is very concerned with the context in which the specific phenomenon or the behaviour being explored occurs and it seeks to draw comparison between themes and identify patterns while maintaining this contextual perspective (Hussey, 1997). The valuable insight into pertinent human or social practices gained through qualitative approaches makes it possible to develop conceptual theories (Leech & Onwuegbuzie, 2007).

3.3.2.2 Case Study

The case study method, one of the many that are used in qualitative methodology, was selected for the purposes of conducting this particular research. It is defined as “an empirical inquiry about a contemporary phenomenon (e.g., a ‘case’), set within its real-world context—especially when the boundaries between phenomenon and

context are not clearly evident” (Yin, 2012, p. 4). It stems from a desire to obtain deep insight into a small number of cases in their natural settings, in order to acquire new knowledge about a phenomenon with due account taken of the context and complex circumstances related to the case (Yin, 2012). Baxter and Jack (2008, p. 545) refer to Yin’s (2003) conditions under which the case study method should be adopted, namely when:

(a) the focus of the study is to answer ‘how’ and ‘why’ questions; (b) you cannot manipulate the behaviour of those involved in the study; (c) you want to cover contextual conditions because you believe they are relevant to the phenomenon under study; or (d) the boundaries are not clear between the phenomenon and context.

Yin (2012) adds ‘what’ to the questions in (a). This results in a descriptive case study, used to describe current practice. In investigating ‘what’ the suitable e-skills are for DI, as well as ‘how’ they are delivered, this study has aspects of both a descriptive and an exploratory case study, which is used when investigating a field where insufficient information or theoretical knowledge exists. It is certainly the case that there is a lack of information on e-skills in the WC and South African context.

Secondly, the researcher had limited control over the study and the participants. This meant the researcher was unable to manipulate the behaviour of those interviewed or their perspectives on the training and acquired skills. Similarly, the researcher had no control over the trainers, their views, the skills included within the curriculum or the approach with which it is delivered. Thirdly, the researcher was extremely interested in the personal and environmental contextual conditions, and fourthly, it was exceptionally difficult to separate the context from the skills and learning process. It seems clear that the case study design chosen was appropriate for this research.

3.3.2.3 The Sample: Participant selection

Purposive sampling is often used to select participants in qualitative research (Devers & Frankel, 2000). This sampling strategy, which is sometimes referred to as judgemental sampling, “is most effective when one needs to study a certain cultural domain with knowledgeable experts within” (Tongco, 2007, p. 147). The selection of

sample members is therefore a deliberate and non-random decision to include those with specific knowledge and able to provide the most insight and perspective on the subject under investigation (Tongco, 2007). This enriches understandings of particular issues and enables the formation of more comprehensive theories (Devers & Frankel, 2000; Purposive sampling, 2012). This form of sampling selection relies heavily on the judgement of the researcher and is inherently biased. However, purposive sampling has important benefits: the selection of appropriate knowledgeable participants increases the quality and reliability of the findings and it makes the sampling process more efficient (Tongco, 2007). Given the nature of this method, purposive sampling usually consists of a small group of participants (Purposive sampling, 2012).

The researcher selected three representatives of the WC e-skills CoLab, able to provide insight into the subject of e-skills for WC citizens and appropriate delivery approach factors. These individuals were: (i) a trainer/facilitator who was involved in the design and implementation of the programme; (ii) the head of the programme who was actively involved on all levels from curriculum design to training and; (iii) the director of the CoLab situated at the UWC, who oversees all CoLab initiatives. The majority of those in the selected sample are e-centre employees who completed the e-skills training at the CoLab. A list of these trainees, the sampling frame, was obtained from the project facilitators. The list indicated only the basis of cohort and residential location. This information was considered important in selecting a representative sample and thereby limiting the bias in the subjectivity of purposive sampling to some extent. Four cohorts had undergone training at the time of data collection and participants were selected from each group. Trainees were spread across the province in (what the CoLab representatives considered) urban, peri-urban and rural locations. However, the distinctions between these categories were not clearly defined. Nevertheless, it may be said that participants were selected from different provincial areas, diverse in demographic profiles and developmental states, with as much as 462 km between certain towns. The researcher's direct observation of the pilot training revealed one visually impaired e-centre employee, who assists citizens with the same challenges. This individual was specifically selected for his unique insight into and perspective on the e-skills challenges of members of society with some form of physical challenge or impairment. Each sample member was

contacted telephonically, introduced to the research project and asked whether he or she would agree to be interviewed. This led to the inclusion of ten e-centre employees (across the span of cohorts), residing in eight different provincial areas. At the time of the research, the sampled centres constitute approximately a fifth of centres included in the training programme.

Overall, the sample consisted of thirteen participants – ten trainees and three CoLab representatives. Each of these perspectives was necessary to develop a comprehensive understanding of the state of DI in the WC, the relevant e-skills and successful approach factors. Qualitative approaches are often criticised for the use of small samples. However, this criticism can be countered by the argument that the focus is on in-depth understanding, so small samples - 12 to 15 cases - are considered sufficient for this type of complex subject matter (Devers & Frankel, 2000). In their defence of small sampling in qualitative research Crouch and McKenzie (2006, p. 493) have stated that “in principle, just one ‘case’ can lead to new insights... if it is recognized that any such case is an instance of social reality.” Further, they questioned: “How many times does one have to see a two-headed calf to be able to say that it exists?” (Crouch & McKenzie, 2006, p. 497) Budget and time constraints are also factored into qualitative sampling (Oppong, April, 2013). In the case of this research, this sample size was influenced by what would be practicable, given the provincial travelling required in order to conduct face-to-face interviews and personally observe the local e-centres and community settings.

3.3.2.4 Data collection

Yin (1994) identifies six methods of data collection:

- Documents (letters, agendas, progress reports)
- Archival records (Service records, organisational charts, budgets etc.)
- Interviews (typically open-ended, but also focused, structured & surveys are possible)
- Direct observations (formal or casual; useful to have multiple observers)
- Participant observation (assuming a role in the situation & getting an insider view of the events)
- Physical artefacts.

This particular investigation used interviews as a main source of data. While this is the most common form of qualitative data collection, a great deal of variation exists in aspects such as duration, depth and structure (e.g. strict and formal to more casual and free-flowing) (Crouch & McKenzie, 2006). In addition, data were collected through direct observation of the face-to-face training phase of the pilot cohort, as well as several seminars and meetings of those involved in the project. Official project research reports were also examined for any further relevant information affecting findings. These documents reported on the activities and progress of this specific e-skills project.

All interviews were conducted face-to-face, which is widely considered the best method of retrieving information when dealing with more complex issues, such as the subjects of e-skills and DI (Dialsingh, 2008). The researcher travelled to the locations of each of the sample e-centres, which also provided a perspective on the environmental context of the participants. The three CoLab representatives were interviewed at the UWC. A relationship of trust was developed with the e-centre employees. They were set at ease by being told that the researcher was a student attempting to gain knowledge through listening and learning from them. This trust was increased through the use of informal language and wording and the encouragement to speak freely. All interviews were recorded using a Dictaphone and later transcribed. Interviews were semi-structured. In other words, the researcher entered prepared with a set of possible questions and issues to be discussed. The discussion took the form of an open conversation where the wording of questions was not restricted to the formulations in the questionnaire and the interviewer remained open to new directions the conversation took, as long as it remained relevant to the subject under discussion (Patton, 1990). Participants were not provided with any questions ahead of time. The questions posed to the sample group were based on information obtained during the literature review and pertained directly to the three research sub-questions.

The e-centre employees were recognised and treated as more than trainees, but as individuals with a wealth of knowledge and information on their specific centres, the users and the local community members. The researcher sought to elicit this knowledge and gain insight into the e-skills levels, needs and challenges of the

community members, in addition to their own individual perspectives as trainees at the CoLab. This was considered advantageous, not only because it provided a broader outlook of the e-skills of WC citizens, but also because it enabled those who were nervous or hesitant to discuss their own abilities to be set at ease. They gained confidence by discussing what they know – the general abilities of their centre users or community members.

3.3.2.5 Data analysis

Qualitative data analysis is the process of studying and interpreting raw data to draw logical findings (Lofland & Lofland, 1995). It entails “working with data, organizing it, breaking it into manageable units, synthesizing it, searching for patterns, discovering what is important and what is to be learned, and deciding what you will tell others” (Bogdan & Biklen, 1982, p. 145). Qualitative analysis is strongly related to making meaning and involves creativity on the part of the researcher who must identify critical categories and themes (Hoepfl, 1997; Krauss, 2005).

The analysis of this study relied on elements of Grounded Theory. This was developed in the 1960s by Strauss and Glaser whose opinions on the theory have changed somewhat. The division among grounded theorists resulted in different methods and perspectives within the broader approach, however, the main intention is still to generate theory (Walker & Myrick, 2006). One of the most commonly used qualitative analysis techniques (contained within grounded theory) is the method of constant comparison involving searching for similarities, patterns and trends throughout each of the interview transcripts, across cases (Leech & Onwuegbuzie, 2007; Walker & Myrick, 2006). These related findings are labelled according to certain categories, sub-categories and grouped into broader themes, a process known as the coding of data. These labels are completely subjective and depend on the researcher, “however, the label should reflect their nature and content” (Hussey, 1997, p. 266). This continues until the entire data set has been sorted and all meaningful aspects have been included in suitable categories (Leech & Onwuegbuzie, 2007). “Coding is an iterative, inductive, yet reductive process that organises data, from which the researcher can then construct themes, essences, descriptions, and theories.” (Walker & Myrick, 2006, p. 549) The labels of categories stem from concepts discovered during the literature review or may emerge from the empirical data and the coding process continues throughout the research study, both

prior to and post data collection (Leech & Onwuegbuzie, 2007). This continuous coding undergoes much refinement throughout the entire process of analysis (Dye, Schatz, Rosenberg & Coleman, 2000). According to Glaser and Strauss, the method of constant comparison consists of four stages (Dye et al., 2000, para. 3):

1. Comparing incidents applicable to each category,
2. Integrating categories and their properties,
3. Delimiting the theory, and
4. Writing the theory.

The comprehensive review of the relevant literature, which formed the starting point of this investigation, attempted to find answers to the three research sub-questions. The investigation was then also done empirically through interviews with individuals involved in the e-skills for DI project at the WC CoLab. Certain categories and sub-categories arose out of both processes, which could be compared through the method of constant comparison. An example of the process within the context of this study is provided in Table 14 below. Through this technique and the emerging patterns discovered in its use, a conceptual model illustrating e-skills for DI was created.

Table 14: Example of research coding (Source: Author)

Category	Sub-category	Extract from data set
Barriers to DI	Negative attitudes	<p><i>“We do find that there are some of those people that do not want to share. If they’ve gained skills they think it’s theirs so they keep it to themselves...”</i></p> <p><i>“...despite their challenges they were motivated whereas people who had the resources weren’t that motivated.”</i></p>
	Language	<p><i>“English is the important one [because] of the computer and sometimes it’s difficult to explain some things that’s in English in Afrikaans [because] I don’t speak any African languages.”</i></p> <p><i>“I don’t [want to] look stupid then I prepare myself in English but at the end of the day I talk Afrikaans and</i></p>

Category	Sub-category	Extract from data set <i>English</i>
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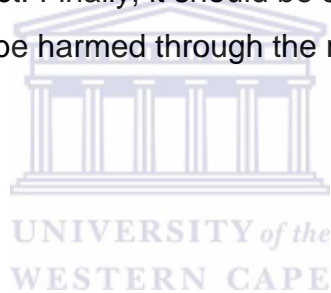
3.3.2.6 Validity and reliability

Validity refers to whether the findings and inferences drawn are in line with the actual phenomena under investigation, while reliability refers to the possibility of replicating the findings (Hussey, 1997; Peräkylä, 2011). Reliability in qualitative studies is generally more complex than in quantitative approaches. Instead of concentrating on exact replications, researchers are concerned with presenting findings which are similar to observations made by different researchers under similar conditions (Hussey, 1997). Presenting data which hold informative value is more relevant in qualitative research than replicability (Friedhoff, Meier zu Verl, Pietsch, Meyer, Vompras & Liebig, 2013). The difficulty of defining validity and reliability in qualitative approaches has led to beliefs that these concepts should be replaced by discussions on the trustworthiness, credibility, dependability and quality of the research (Golafshani, 2003; Travis, 1999). In this particular study, the complexity of the subject matter, the pace of ICT developments and the elusive and often uncritical use of concepts such as DI and e-skills make it difficult to be certain that the same findings will be made on different occasions or in varied contexts. The resonance between literature and empirical findings, however, suggests that relatively similar findings regarding DI, e-skills and pertinent approach factors should occur in other studies of this nature in similar settings. Triangulation of data is one way of ensuring a more accurate and trustworthy outcome as “engaging multiple methods, such as, observation, interviews and recordings will lead to more valid, reliable and diverse construction of realities” (Golafshani, 2003, p. 604). Observations and document analysis were used in addition to interviews to assist in minimising bias and increasing the credibility and quality of research.

3.3.2.7 Ethical considerations

Ethical concerns are often more complex than they may appear. Particularly in qualitative research, issues such as invasion of privacy are accompanied by other potential concerns, some less obvious than others. These include the researcher having a negative effect on the participant’s self-esteem, deceiving, disrespecting, mistreating or causing the interviewee any form of distress (Cohen, Manion & Morrison, 2011). The researcher made the utmost effort to meet all the ethical

requirements. The confidentiality of information (particularly the audio recordings of interviews which was a concern to some, initially), was guaranteed and treated in the strictest confidence. The anonymity of each participant was also maintained throughout the research by referring to subjects as trainee, provider or interviewee/respondent: mention is never made of specific names. Each participant was informed of the nature and objectives of the study orally (telephonically and in person) and in writing, by giving them the Information Sheet (see Appendix C). Their permission was also obtained in written form in the letter of Informed Consent (see Appendix D). Both the researcher and the participants have signed copies of these agreements. Participants were also informed of their right to stop the interview at any point should they feel uncomfortable or request the researcher to move to the next question if they did not wish to discuss a particular question, thereby avoiding any form of mental or emotional stress. The utmost effort was also made to treat each individual fairly and with respect. Finally, it should be stated that no participant or any indirect participant was or will be harmed through the reported findings.



CHAPTER 4: EMPIRICAL FINDINGS AND DISCUSSION

4.1 Introduction

This chapter reports the empirical findings, while simultaneously comparing these with findings from the reviewed literature. The discussion centres on each of the research questions exploring: i) the conceptualisation of, and barriers to DI; ii) the relevant e-skills for DI and; iii) significant e-skills delivery approach factors. The verbatim citations are provided in italics and identified as follows:

- *Provider* refers to the three interviewed WC CoLab representatives, responsible for e-skills delivery. Each individual was assigned a title of Provider 1, 2 or 3 used throughout the chapter, maintaining anonymity. The term '*Supplier*' was used interchangeably.
- *Trainee* refers to the ten interviewed e-centre employees, each assigned a number e.g. Trainee 3. The term '*e-centre employee*' was also sometimes used to refer to these participants.
- *Research report* refers to *Digital Inclusion: Fundamentals of eCentre Management Training Programme*, the report written by Stoltenkamp et al. (2013), representing the Western Cape Knowledge Production and Coordination CoLab.

4.2 Digital Inclusion

This section of the analysis focuses on the conceptualisation of and barriers to DI in the WC, based on the empirical research. These were compared to the literature-based findings.

4.2.1 Conceptualisation of Digital Inclusion

The DI perspective adopted by the CoLab accords with the reviewed literature in 2.2.1) which advocates a social rather than a technological focus. The CoLab representatives emphasised that DI must not be regarded as a technical issue but rather one of "*human capacity development*" (Provider 3):

We [are] not talking [about] 'techie' stuff because it's not what it's about... What we [are] talking about is people development and organisational

capacity development and technology is the medium. As we [previously] used books... now we use a different medium. (Provider 3)

Another provider confirms this, claiming that *“no digital inclusion course is about technology; the entire programme is about processing people into technology”* (Provider 2). According to this individual, the WC has only just scratched the surface of this process. Accompanying the focus on “people development”, (Provider 1) is the CoLab’s stance that the purpose of DI is to address the social and economic problems, posing a challenge to particularly the marginalised WC communities. Providers were particularly adamant in expressing this view, as is illustrated in the following reports:

I think we must realise if you go into our communities, they are in trouble – drug infested, alcoholism, teenage pregnancy, unemployment etc. What are our Digital Inclusion programmes going to do for their lives? (Provider 2)

People in the communities don’t know what to do. Social and economic issues is a big thing, they don’t have work and have nothing to do so if they come to the e-centre, they get trained and they become employable so they can go out and look for something else (Provider 1).

These extracts highlight the enormity of the challenges faced by disadvantaged WC communities, and leave no doubt that these providers see the central aim of DI as addressing and alleviating these struggles. These reports also illustrate that the intention of DI according to this initiative is directly in line with the short-term impacts outlined in literature. Drug use, alcoholism and unprotected teenage sexual intercourse are all prevalent behavioural patterns in these communities. The CoLab hopes that the implementation of DI initiatives will improve the quality of life to some extent and thus gradually change these behavioural patterns.

DI, as perceived by the providers, is clearly largely conceptualised in relation to social inclusion and using technology to assist in local social development. It is also believed to be closely related to the concept of *“social innovation”*, which they report *“...simply means that society takes responsibility for developing solutions for their socio-economic problems and challenges, and the question here is ‘how can you use ICT as part of the solution?’”* (Provider 3) This provider explains that social

innovation is possible without technology but in this age, e-skills and ICT should be used to assist the process. In simple terms, it is the providers' belief that the purpose of DI should be to enable WC citizens to identify problems, think of solutions and then make use of appropriate ICT opportunities to assist in providing these solutions. This resonates with another empirical finding that technology should be used as an enabler to assist individuals in whatever way is relevant or useful to him or her personally. In accordance with Mariën and Van Audenhove (2010) and HM GOVT (2008), the empirical findings suggest that ICT should aim to assist only where there is a specific need, rather than impose unwanted technology on communities leading to unwanted, irrelevant or unnecessary results. DI should relate to "*what is useful for that community or that group of people*" (Trainee 2). The need for DI in marginalised WC communities to focus on these small, relevant and meaningful uses of technology is illustrated in the following e-centre employee's observation:

Most of them just come for making photocopies or print outs and what we do these days [is] we help them if there's an email address with that fax they want to send, we help them to use the computer to send an email rather than sending a fax. That's like some of the stuff we really use. (Trainee 6)

The e-skills providers hope that in aiming for small benefits relevant to the individual's life, larger results will follow. While these small objectives (e.g. the access and skills to find information), are taken for granted in much of society today, they are anything but minor in these contexts. Consider the earlier statement made by a provider relating to daily circumstances in many of these disadvantaged communities, "...*drug infested, alcoholism, teenage pregnancy...*" Appropriate information and knowledge at the right time could change habits and thus prevent many of these incidents, as well as provide necessary solutions and support to those who already find themselves in unfortunate situations. Simple benefits may have massive impacts in much of the WC. While the provision of information and basic day-to-day benefits are the primary and more realistic goals to enhance lives, it is hoped that aspects such as education and employment are also eventually improved. The providers recognise that the skills required for their conception of DI lie far beyond basic ICT literacy. A provider stated:

“Basic ICT skills are still important... [but] the objectives of this Digital Inclusion is not basic ICT literacy skills...I think for me Digital Inclusion, first and foremost is about thinking.” (Provider 2)

Perhaps critical and strategic thinking (Ala-Mutka, 2011; Chinien & Boutin, 2011; Van Dijk, 2013; Van Deursen & Van Dijk, 2008), partially entailing the ability to identify specific goals and attain these objectives and benefits through the use of ICT, are much more relevant (than basic ICT skills) to these “thinking” and “social innovation” conceptualisations of DI. Learning is also emphasised in this thinking process, as one participant stated: “...*the first question I ask [the community member] is ‘Are you registering to come and learn or to see what a computer is?’*” (Trainee 8) However, the main stress was on lifelong learning. The aim is to develop citizens who are able to create their own paths out of challenging environments in which they now find themselves. One provider explained:

I think skills development is very important for our people, because they then are trying to find learning pathways for themselves out of these socio-economic dire situations they find themselves in... It’s motivating these people and if you giving them e-skills, that’s going to put them on a learning pathway... attaining lifelong skills, so I think lifelong learning skills is key in this programme. (Provider 2)

The themes of “thinking” and “lifelong learning” which are so important to providers are closely related to the concept of knowledge, repeatedly mentioned by the providers in the context of the transfer and creation of knowledge by WC communities: “...*we should be promoting to our people that they should be starting to create knowledge themselves...*” (Provider 2) This belief is so central to the CoLab’s overall DI stance that its priority objective includes: “to produce knowledge and coordinate innovation” (Stoltenkamp et al., 2013, p. 3484), affirming the importance of developing a knowledge-based society so evident in the literature. However, the providers consider that developing critical and strategic thinkers and individuals able to create content and knowledge are beyond the scope of the simple expected and immediate outcomes of their DI programme. The concept of DI as perceived by the e-skills providers, therefore extends much further than the narrow notion of providing access and basic ICT skills, which is the case in many DI

initiatives. Provider 2 aptly explained that DI is not about providing basic ICDL type skills but taking it “*a step further*”. As was discussed earlier, in the literature, DI is seen as the appropriate use of a range of e-skills for personal and community empowerment and upliftment. This was evident in the CoLab’s objective to “empower [marginalised groups] to become self-directed users” and the belief that through e-skills development “Individual learners can become capacitated to take increasingly more responsibility for various decisions associated with their learning endeavours” (Stoltenkamp et al., 2013, p. 3490). “*The overarching goal here is... to focus on the upliftment of the development of the country ... I think there is a fair understanding that ICT is an enabler.*” (Provider 3) The literature and empirical findings are in accord that empowerment and upliftment are envisioned long-term impacts of DI.

In summary, the empirical and literature findings reach the very similar conclusion that DI is far more than a technological issue. The immediate concern of DI was to enable marginalised communities with the access and skills to find and use information. It also wished to increase the capacity of community members to use ICT in personally relevant ways. One of DI’s foremost concerns is the overwhelming social challenges facing these communities. It is envisioned that the newfound access to information will gradually reduce some of the difficulties these people face by shifting behavioural patterns and improving the quality of life (even if only slightly). Although a definite and direct correlation cannot be made, the hope of DI initiatives is that the initial basic use of ICT will progress into thorough domestication of technology in most facets of everyday life, leading to a far wider range of benefits. In addition, they hope that passive consumption of information will give way to active creation of content and knowledge, and that the users will eventually become critical and strategic thinkers. At the broadest level, the desired impacts of DI include the increased participation in society of marginalised members, social innovation, human capacity development, empowerment and upliftment. Given the “*dire*” (Provider 2) socio-economic context of the marginalised WC communities with employment, education and poverty as but some its serious concerns, these conceptualisations of DI are considered national priorities.

4.2.2 Digitally excluded groups

The empirical research provided a general indication of the groups that are typically at risk of being digitally excluded in the WC. The most emphasised of these were the groups that were disadvantaged during the Apartheid era and largely still in a position of social and economic disadvantage. According to one provider these groups “...come from deep oppression [during] Apartheid.... Years of always being oppressed.” (Provider 2) The trainees themselves consistently described their local communities as “very underprivileged” and “disadvantaged”. Given that the oppressed under the Apartheid regime were mainly Black and Coloured groups, it follows that it is this racial demographic which constitutes the majority of the WC’s digitally excluded: “...race wise, it’s between ‘Black’ and ‘Coloured’ groups basically [in need of ICT skills training and] not that many ‘White’, ‘Indian’ or ‘Asians’.” (Trainee 2) This extract was from the only ‘White’ trainee (both in the sample and larger cohort). What makes his opinion on this demographic issue valuable is that he is the only trainee whose centre caters to a large, racially diverse geographical area. In contrast, the remaining e-centre employees reside in and cater to either predominantly or entirely non-White smaller communities. English is significantly less spoken in these (primarily Afrikaans or Xhosa) areas. There is thus some overlap between (‘Black’ and ‘Coloured’) racial groups and non-English natives under the broader umbrella of historically disadvantaged groups.

For the most part, these non-White communities are situated in underdeveloped, geographically remote and peri-urban areas designated for them by the Apartheid regime. There is therefore a strong correlation between underdeveloped (peri-urban and rural) areas and historical disadvantage although this geographical indicator of exclusion is not necessary limited to the disadvantaged. Similarly, while the majority of the province’s socially and economically excluded fall into this category, socio-economic exclusion extends beyond racial and historic boundaries, particularly to many of the unemployed and uneducated, regardless of race. For this reason socio-economic exclusion is a distinct and separate category in the discussion of digital exclusion.

Six of the trainees noted that very few elderly community members make use of the e-centres. e-Skills providers speculated about the reasons for this in their

observations that cohorts with an increased average age appeared to take longer to grasp certain skills. One trainee reported that unlike younger citizens, the elderly were more likely to ask for assistance and were only interested in the communication functions of the Internet:

...we have had people like 80 [years old] and so on as well but they just want to learn how to use the computer for communication purposes, email, Internet that type of stuff... (Trainee 10)

This not only highlights the need to recognise the elderly as an excluded group, but also the need for DI strategies, which target specific groups, providing specific skills for personally relevant purposes. The only e-centre employee working with physically impaired groups noted that these are members of society particularly in need of e-skills training. He described the greater challenge in including these groups, given the unfortunate effect of visual impairment on e-skills development:

...if you give notes, they can't read it [because] they blind so they must use the computer to read it for them but they can't use the computer to read it for them so [it's a] catch 22 [situation]. (Trainee 2)

The empirical findings differed from literature (see 2.2.2), which identified females as generally less digitally engaged. Two trainees reported that the amount of females using each of their centres outweighed males, while another reported a balance between sexes, stating that “...it's equal...” (Trainee 1) The only trainee in the possession of actual centre statistics agreed with this balance reporting that no differences existed in terms of skill levels and that the “...male-female [ratio] is about 50/50.” (Trainee 2) The rest were unsure and only one interviewee felt that males were more digitally active within the local e-centre and larger community.

4.2.3 Barriers to Digital Inclusion

This section examines the barriers to DI (and often e-skills development) identified by literature in relation to the specific WC findings. These include: Awareness and knowledge; Access; Education; The quality and context of use; Attitude and; Language. Given that the focus of this research is e-skills, the skills barrier is excluded from this section and discussed in depth in 4.3.

4.2.3.1 Awareness and knowledge

According to the WC CoLab's conceptualisation of DI, people need to capitalise on technological opportunities to assist them in relevant and meaningful ways. In order to do so, an awareness of the existence of these technologies and where to find and learn to use them and knowledge regarding the context of use, the value of information, and the potential benefits are required. The interviews revealed a definite awareness of the pervasiveness of technology in society, evident across the entire e-centre employee sample group. Remarks from trainees include:

In today's society we live in true technology. (Trainee 5)

...everything, everything, you just need [ICT and skills]. (Trainee 1)

Technology is so advanced you can't fall behind; you must keep up with the pace of how life's changing. (Trainee 3)

This should not be seen as an indication that community members have a clear sense of the availability of e-skills training or the existence of these centres and the benefits that they offer. Although most trainees did not take part in any outreach or awareness raising activities, they all felt most community members generally did not have a clear idea of the nature of the benefits of ICT, even if they had some awareness of its existence and possible benefits. One trainee noted that although they were aware of various types of ICT, the community members were generally "slow" to use them. It is likely that this is partly because they do not have a clear idea of the potential opportunities and benefits they present.

Regarding the interviewed trainees' own awareness of the significance of technology and e-skills, providers reported a lack of knowledge of meaningful ways of using devices, stating that "*they weren't aware of all the things they could do*" (Provider 1). Knowledge and awareness may also be limited considering the surprise many trainees expressed at what they were taught during training, with some reporting that they knew the technology existed but were unaware of what it was used for. Many were unaware of the concept of e-skills and what it entailed. This is evident in the following statement: "*Initially when they asked us to come to the workshop, we didn't really know what this 'e-skills' was about.*" (Trainee 3) This may not be of much significance, given the great variation of e-skills related terms and what exactly they

entail. With regard to information resources, the level of knowledge amongst the trainees was higher, although some noted it increased during training. Interviews with providers revealed that they consider knowledge on this aspect as a necessary inclusion in e-skills training and incorporated discussion on the information age, the abundance of information and how “*it comes in different forms, sizes and packages*” (Provider 1). Most trainees were not really aware of the safety, legal and ethical issues related to digital media. However, the fact that there are many privacy concerns amongst the larger trained e-centre employee population, according to the providers, and within the communities themselves indicates that more attention needs to be given to building knowledge of ICT and its benefits. The overwhelming perception among the e-centre employees was that the greatest benefit of technology and related skills was an increase in employment opportunities. Reports include:

Better work. Most companies or when you applying for work you need to have computer skills. (Trainee 1)

Any job you trying to apply for these days, they require computer skills. (Trainee 2)

I think [e-skills are] important [because] nowadays wherever you go, if you want to go into the job market that's one of the requirements. (Trainee 3)

While providers also regarded employment opportunities as important, the interviews revealed this to be less of an immediate focus in terms of intended benefits. One provider expressed the view that the main immediate benefit of access to technology in these marginalised communities was access to information, which in turn would hopefully lead to a multitude of other advantages and opportunities in terms of health, education and employment amongst other areas. Her belief is that DI and e-skills development in the WC should be aimed at smaller, realistic benefits which would eventually lead to larger socio-economic effects.

...the most obvious benefit is for them to get access to information... once I've got access and I've got skills what is the next step... that's where we talk about the local economic development. (Provider 3)

It seems that e-skills providers in the WC saw technology as simplifying lives of particularly the marginalised groups in practical ways, *“which means they save time and they save money, so that would be an obvious benefit to them.”* (Provider 3) The trainees themselves made very little mention of other benefits or opportunities that having e-skills would give. One of the more skilled trainees, however, seemed to understand that the e-skills providers intended to enable trainees to use technology to improve and simplify their lives, essentially to become self-reliant. He believes that e-skills *“...just gives them more options... [not having to pay] for other people to do [things when] they can do it themselves”* (Trainee 2). Another trainee, who saw beyond the employment aspect, considered e-skills to be a means of self-growth and human capacity development, stating that: *“learning through computers, that opens doors for you. It’s like striving to be a better you so that’s the best life skill you can learn, strive to be the best.”* (Trainee 6)

It seems then that lack of awareness of the opportunities created through e-skills development is a barrier to DI in the WC and requires further attention. This is particularly true of the legal and ethical issues involved in digital media and the potential benefits which having e-skills brings. This is a significant factor in the slow adoption of technology within these largely excluded communities.

4.2.3.2 Access

Interviews with the entire sample confirmed access was a barrier to DI in the WC. The e-skills providers each reported that the e-centres visited were mainly in largely *“disadvantaged”* areas. This was confirmed during the site visits during the research. The programme’s research report indicated that the e-centres offer very basic services and *“are not in a position to meet the demands of the community at large.”* (Stoltenkamp et al., 2013, p. 3488) It also conveyed that the trained e-centre employees, across cohorts, had complained about *“outdated infrastructure, technology (hardware and software), unstable Internet connections, regular power outages, limited office space, short time allocated for the use of resources...”* (Stoltenkamp et al., 2013, p. 3491) This is a serious concern given that most centres are the only source of computer and Internet access for much of the surrounding neighbourhoods. One trainee reported: *“We’ve got people who come from as far as... about 20km from here... We’ve got people from other areas who make use of*

this facility’ (Trainee 8). During an interview with another trainee, a community member approached the centre in need of the facilities only to be informed that the centre was closed for the day – on a weekday. Considering that this is the only form of access for much of the community, this is a serious problem. The issue of the limited operating hours of these public access centres was also apparent in the programme research report. This indicated that centre users had complained that the time allocated to each person during a session at e-centres left them unable to complete their desired activities. Even when there is also access to ICT at certain local schools, trainees reported that heavy restrictions on local school computers leave the majority of older community children largely excluded, while “...we were almost certain [that] from grade 1-4, they’ll never come across a computer.” (Trainee 8) The fact that only two of the ten trainees owned or had any access to a computer outside of the centres is further confirmation of the access barrier. The previously discussed distance to centres for many leave transportation and costs as an additional access related challenge. Provider 2 stated: “...our [marginalised] people don’t have money”. Another elaborated that “if they got [online] access [to pay for services] they can pay it, which means they save time and they save money.” (Provider 3)

Another problem revealed in the empirical findings is the Internet connection difficulties that many experienced during the online CoLab training. This meant that they were not able to do certain tasks. This is clear evidence of the ongoing Internet access problem in marginalised WC areas. Fortunately, the programme was able to make provision for this by having the content available on a CD-ROM:

We say the content is online... but if you have Internet problems we also put it on a CD-ROM... We gave them some access to the basket of open source tools on the CD-ROM as well. So it’s definitely about access.... (Provider 2)

However, some of the e-centres were not equipped to offer this CD-ROM function as an alternative – further illustrating access difficulties. A provider perceived this lack of reliable, continuous access as a challenge in the province because of the “*direct link with their socio-economic development*” (Provider 3). She explained how lack of ICT access contributes to the perpetuation of stagnation in the socio-economic development of the disadvantaged, while increasing the opportunities and

development of those with access. In this way ICT access succeeds in increasing the already wide gap between the WC's underdeveloped and developed communities.

If people don't have access, it means that those people who are already poor and already disadvantaged will become more disadvantaged, because now you give to people who are doing well or have at least got the monetary fund to pay for access, they've now got the ability to advance their possibilities. It's like accelerating and you don't give them [the disadvantaged] any way to accelerate. (Provider 3)

Both the literature and the empirical findings confirm that access is a barrier to DI and e-skills development in the WC for many marginalised communities.

4.2.3.3 Education

The bulk of the larger group of trained e-centre employees had completed high school (senior certificate/ grade 12) although two had dropped out, some fairly early on. While tertiary education was not listed among the higher education achievements, a few trainees had completed some further education courses (e.g. Certified Professional Receptionist; ND: Public Management; Certificate in Customer Service; ICDL Core Certificate). The education levels in the sampled communities are fairly poor (see Appendix E). With the exception of Salt River (the area closest to the Cape Town central business district), between 55% and 76% of the adult community members have not completed high school.

Each trainee considered the education levels in their respective communities to be fairly poor and significantly impact on the extent of digital engagement. The following extract from an interview with a trainee accurately sums up the general consensus of the sample:

We have a problem with [information literacy] because we have low [basic] literacy skills of the guys that come here. Specifically this year was a bad year. The education level is low so they don't understand the question, so they can't get through the task... comprehension is a big problem because they read questions and they don't understand what they must do." (Trainee 2)

These findings reveal that education is a substantial barrier to the effective use of ICT, particularly to the development of e-skills. While it may not be the most relevant barrier in the technical use of technology, it is to the use of cognitive, information-related skills. It is therefore an area which requires urgent attention.

4.2.3.4 The quality and context of use

Empirical findings revealed that technology is being used in very basic ways in these communities, far from realising the full potential and greater possible opportunities. The research report revealed that the e-centres were used for “printing, free email, free Internet, research for school programmes, general research, and free access to government services, informal training, formal training and laminating documents”. This was unlike more developed settings in which the “resources and technical facilities [are used] for self or guided study and for video conference, e-mail and talk-back TV access to specialist tutors” (Brooks 1999 cited in Stoltenkamp et al, 2013, p. 3488).

While not specifically mentioned above, interviews revealed that trainees (and according to them, their respective communities) mainly used ICT for social networking. All of them had Facebook accounts (before the e-skills training) and there was an overwhelming consensus that Facebook was widely used in their respective communities amongst those using ICT. The trainee who worked with visually impaired WC citizens stated that *“Facebook is pretty blind friendly if you wanna call it that. You can navigate it with the screen reader”*. He mentioned however, that *“It’s the more experienced guys, the guys that complete the course, which will start using that [because] we introduce them to it during the course. It is part of the syllabus”*. (Trainee 2) This gives an indication that appropriately designed e-skills training initiatives have the capacity to influence the context of ICT use. All of the trainees in the sample have Facebook accounts although they may not necessarily be active users. Many specifically expressed their fondness of this application: *“I love Facebook.”* (Trainee 10) For others, it was less of a priority or interest: *“I don’t really use it. If I go on it, it will be maybe once a week... but I won’t [use] Facebook constantly.”* (Trainee 2) Although Facebook was ubiquitous throughout this sample of e-centre employees, the e-skills providers noted that this was not the case for the entire trained population, some of whom had to be shown

how to set up an account. The empirical findings of this study somewhat differ from the reviewed literature (see 2.2.2.2), which suggests a low penetration level of Internet mobile technology within marginalised communities. Nine of the ten trainees reported that applications like Whatsapp, Mxit and – to a much lesser extent – Twitter were frequently used in their local areas. They also reported that while the popular Facebook is still widely accessed through the e-centre computers, more citizens are accessing these by means of cellular phones. These mobile social networking applications were described as largely unused in the visually (and otherwise) impaired community, according to Trainee 2, who was working with this group. Other forms of digital communication like e-mail were in use although to a lesser degree than social media.

The use of ICT for social purposes was closely followed by the objective of searching for employment. This was mentioned by eight of the ten trainees, as well as each of the e-skills providers. This includes searching job websites and developing curricula vitae. While some of these job websites are also platforms for other consumer services, the only trainee who mentioned this kind of possibility doubted whether these were actually used. Interestingly, using the Internet to acquire information was limited to children doing school research assignments. Four trainees also reported that children came to the centre to use features like digital gaming. The researcher observed children doing this, as well as adults in the process of compiling curricula vitae, during her visits to the e-centres. Only one trainee out of the ten said that more virtual interactive platforms like Skype were used at these community centres. However, this was reportedly only made use of by certain e-centre staff members and not the broader community. Two of the trainees (where adequate Internet connection allowed for it) made use of online videos at their centres, but this was described as a largely unused ICT function in the local communities.

Government services or any form of service delivery through the use of ICT was largely ignored in these marginalised communities. Two of the sample e-centres offered access to these:

...to submit certain forms and to get certain forms, they do from the centre. They don't actually go in to [the municipality to] get a form. (Trainee 1)

...all the government services and information... with pleasure we do it.
(Trainee 8)

However, it was acknowledged that while available, the extent of actual use of ICT for this purpose was very low.

According to Trainee 6, a large portion of the community was still using ICT for very basic purposes, placing them far behind other members of society: *“Most of them just come for making photocopies or print-outs... if there’s an email address with that fax they want to send we help them to... use the computer to send an email rather... That’s... some of the stuff we really use.”* This illustrates the degree of exclusion many citizens in these communities experience.

These very basic uses of ICT did not extend to any form of innovative or strategic use of technology. The WC CoLab intended to broaden the context of technological use and introduce new potential opportunities partially by capitalising on the already prevalent use of social media:

...the idea is for them to market their e-centre... You know, use it sort of as a means to see how many people are actually using the centre; marketing events that they have within their centre. (Provider 1)

Trainee 2 shares this aim of improvement, encouraging his e-centre users to direct their skills and ICT usage in a way which may help them professionally and possibly also their surrounding communities.

...we can encourage our learners that are looking for work, to start to set up their own businesses here and provide a service for the community in the area or their fellow disabled people. (Trainee 2)

This particular form of encouragement as well as the CoLab’s focus on meaningful and advantageous yet personally relevant forms of usage appears to be an effective strategy in increasing the quality of ICT usage in disadvantaged communities. The context of technological use is somewhat varied across the sample. However, it appears that ICT is not being used in the most effective manner. This is likely to be preventing these marginalised communities from enjoying the substantial benefits technology could offer.

4.2.3.5 Attitude

Empirical research accorded with the literature that was reviewed in 2.2.2.5 that certain attitudes are a barrier to DI and e-skills development in the WC. While the aforementioned literature discussed this mainly in relation to individual development, the empirical findings also reveal mindsets that oppose and resist the broader culture that the WC CoLab's DI programme is attempting to instil, namely a community of sharing, collaboration and knowledge transfer. According to an e-skills provider:

There [were] those people that didn't want to help anyone else. You just leave them, because the training was also [instilling] a mind-set. We [are] trying to change mind-sets of people and instil a culture where people wanted to actually transfer [knowledge and skills] and help others. We do find that there are some of those people that do not want to share. If they've gained skills they think it's theirs so they keep it to themselves... (Provider 1)

With regard to individual digital competence development, interviews with e-skills providers revealed that attitudes and motivation play a potentially bigger role than access. The effect of motivation levels is illustrated by the fact that e-centre employees who reside in urban areas and have better access to ICT had lower e-skills completion rates than those from areas with insufficient access and poor connectivity.

We found with all the cohorts where people dropped out or didn't complete, it was people from urban areas... People in the Northern Cape who had the worst possible circumstances [and] connection was always a problem, they still managed to complete their discussions whether it was they submit in the online discussion forum or they sent an email or a fax. They tried all the different options... So even despite their challenges they were motivated whereas people who had the resources weren't that motivated. (Provider 1)

Documented reports showed that improved confidence through e-skills was a focus point of the training programme. The assumption was: "As the e-centre manager becomes skilled and more confident, they would be able to market the importance of community development." (Stoltenkamp et al., 2013, p. 3487). When questioned on this issue, providers felt that this had been achieved in many cases, stating, "Some

of them came and they said they dunno how to do anything and by the end of the week they said... 'Now I know how to do this and this and this so now I can go back and do it.' (Provider 1) The same provider also acknowledged that WC citizens are still wary of social media and the Internet and have doubts about their general capacity to participate in digital activities reporting that *"a lot of them had concerns [like] 'no I don't want everyone seeing my stuff'"* and that they *"didn't want to expose themselves"* (Provider 1). Along with this fear, there is little interest in using technology or in e-skills development in many WC communities. They dismiss it as irrelevant or not useful to them. This was pointed out by providers, when discussing the great need for face-to-face sessions to appeal to these groups.

The data obtained from the Interviews illustrated that attitudes and mind-sets play a tremendous role in e-skills development in terms of: i) the level of motivation for learning and the effort made; ii) the decision to share knowledge with others and; iii) the extent to which the skills are put to use post-training. Finally, attitudes amongst WC citizens were shown to be particularly negative, disinterested and lacking confidence where the move from merely consumers to actual creators and contributors of content was concerned, leaving one provider questioning:

Why can these skills that we gave our people now, why is it still not changing their mind-sets, that they can also create knowledge now, [by] using those tools and putting it out there. (Provider 2)

The empirical research therefore supports the findings of the literature review that attitudes are a significant barrier to DI in marginalised WC communities. e-Skills training could counter this by providing the knowledge that will build confidence levels, reduce fear and change particular negative mind-sets and thus motivate citizens to engage with technology.

4.2.3.6 Language

The literature (see 2.2.2.6) identifies language as a barrier to DI and the development of e-skills. This was confirmed during the empirical research. However, the programme's strategy of using a range of culturally diverse trainers meant that a variety of language mediums were used. This was an effective way of catering for

the language needs of the entire group of e-centre employees and largely eliminated the language barrier to training.

We try and do the combination and where people are not so familiar or fluent in a specific language... one of the trainees will speak or explain to them in their native tongue what they are supposed to [do] but it wasn't a [really] big issue that people didn't understand anything that was going on. (Provider 1)

Even though only one of the trainees spoke English as a first language, the entire group insisted it remain the language in which training was conducted. One Afrikaans speaking trainee commented that “*this style of presenting sounds very dumb in Afrikaans*” (Trainee 1). The fact that language was not a significant barrier to skills training amongst this group may also be attributed to the fact that although only a fifth of the population in WC have English as a first language (see statistics in Appendix E), most citizens can understand basic spoken English. One trainee reported that English was a specific focus in her local (predominantly non-English first language community) e-skills training. She explained that this was an intentional strategy used to develop basic English literacy skills, while teaching e-skills, and that centre users are encouraged to use a thesaurus and spell check. A few individuals admitted to having slightly struggled during skills training due to the language barrier. However, they all reported that the assistance and translations provided by providers as well as other trainees made it possible to cope. Remarks from the trainees include:

No, no keep it in English. Ok there were some people who had difficulties with English but I mean if they didn't understand there was someone to translate and I mean... English is the way... (Trainee 3)

It's right in English because it's equal. (Trainee 4)

They mixed the [languages] so everyone was satisfied with that. (Trainee 5)

Despite their insistence, however, there were indications that the language of instruction was somewhat more of a barrier than the trainees admitted. Four of them were clearly uncomfortable and struggled at times to speak English during the interviews. Because of the researcher's ability to converse in Afrikaans, these

interviewees were able to switch to Afrikaans and express themselves with ease. The remaining two were isiXhosa speakers. They experienced some difficulty at times but were able to provide a considerable amount of information. Almost half of the trainees admitted to a sense of discomfort and embarrassment during training as a result of language used. Although they did not explicitly say so in the interviews, this could be a barrier to effective training.

I don't [want to] look stupid then I prepare myself in English but at the end of the day I talk Afrikaans and English. (Trainee 9)

Ooh ek was embarrassed!... [Toe] ek begin praat [in Engels] sê die facilitator vir my ek moet a bietjie harder praat toe verloor ek dit, toe weet ek nou nie meer [nie]... [Translation: Oh I was embarrassed! When I began to speak [in English] the facilitator told me to speak up so I got confused and didn't know anymore...] (Trainee 6)

When referring to the communities where they were employed, the majority of trainees relayed the language difficulty experienced by many e-centre users and local citizens in interacting with ICT. Once again, this challenge was overcome when employees were able to provide assistance in the appropriate language. Where this was not possible, language was a significant barrier.

Where we struggle is we are in a community where most of the people are Xhosa speaking and so if there's a student who's Afrikaans they'll call me [because] I'm the only one in the centre who's Afrikaans [speaking] so I will help the Afrikaans people and we have our Xhosa speaking people who will help the others... (Trainee 6)

What we have a lot here [are] guys that... although they are actually Xhosa, they speak Afrikaans better than English, which is a double problem [be]cause the English is the important one [because] of the computer and sometimes it's difficult to explain some things that's in English in Afrikaans [because] I don't speak any African languages. (Trainee 2)

4.2.4 The problem that is implicit in these reports, more so in the first, is that budgetary constraints in these small centres usually do not allow for the employment of additional staff. The question then arises as to who assists users when the only e-centre employee able to assist them (due to language) is unavailable. The barrier of language described in literature was shown to be a significant factor in WC e-skills training and ICT use. Not everyone in the WC has the ability to understand basic English; language remains a challenge for many in Afrikaans and Xhosa speaking communities. Although the analysis of the data collected during the interviews showed that this barrier can be overcome to a large extent by using multilingual facilitators and through communication with other trainees, this is not yet possible at all centres and skills training. Summary of Digital Inclusion

Thus far, this section has presented an analysis and discussion of DI and related factors. The following presents a summarised version of each of the discussed DI-related areas, namely: Conceptualisation of DI; Digitally excluded groups and; Barriers to DI. The research findings have made it possible for a comprehensive conceptualisation of DI to be included in the final conceptual framework. This is illustrated in Figure 12, which perceives DI through the envisioned short-term outcomes and impacts, and long-term outcomes and impacts.

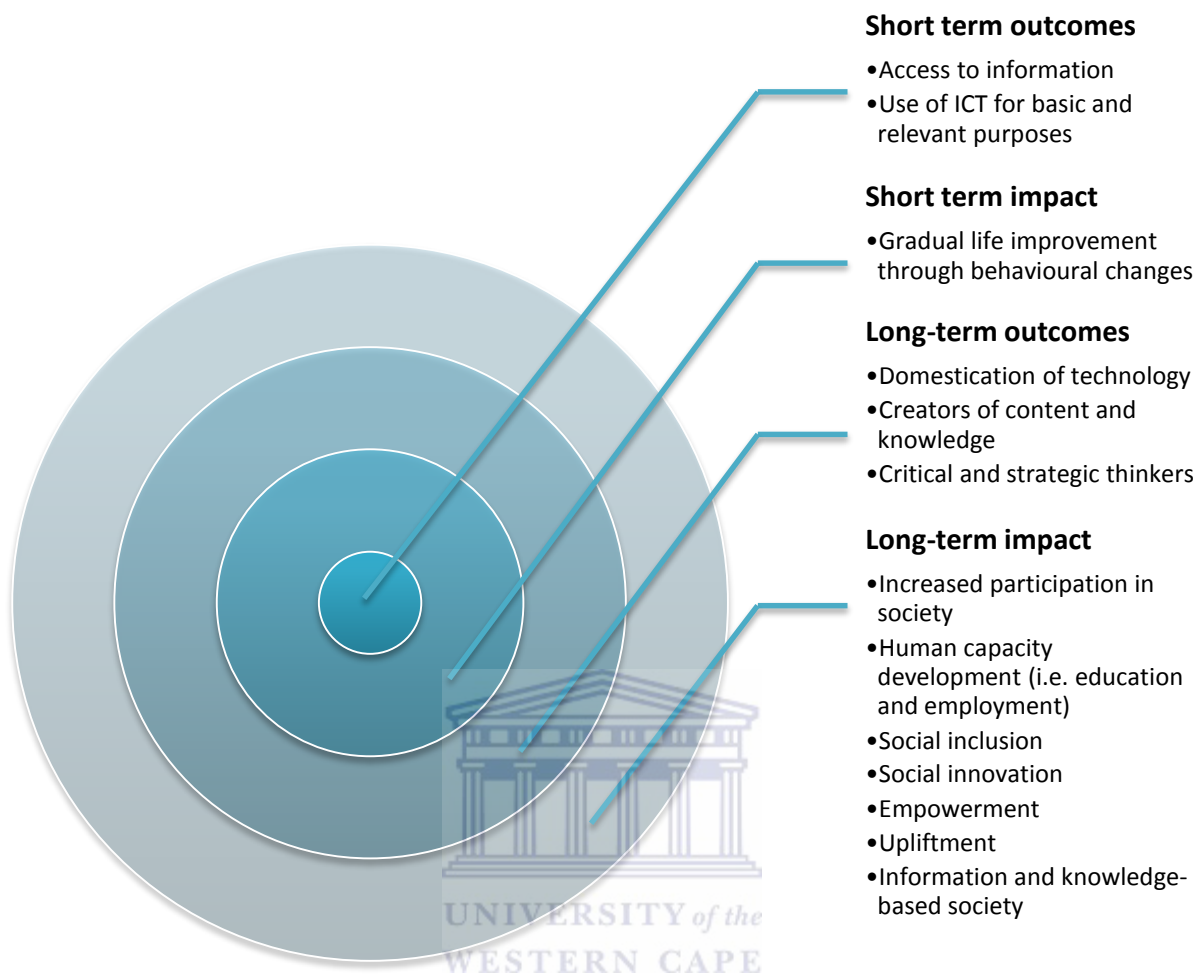


Figure 12: Conceptualisation of Digital Inclusion (Source: Author)

The literature review identified the commonly digitally excluded groups. Empirical findings then provided an understanding of which of the identified groups were generally digitally excluded within the WC. The findings suggest that the typically excluded groups are those who are historically disadvantaged, a majority of whom still struggle as a result of past circumstances. This term generally refers to 'Black' and 'Coloured', Afrikaans and isiXhosa speaking natives living in underdeveloped, geographically remote or rural areas. While these groups are also typically the socially and economically disadvantaged, social and economic exclusion is not limited to them. Similarly, rural areas are not entirely composed of underprivileged groups. However, lack of infrastructure and technological penetration into these areas may leave others equally as excluded. Finally, the elderly and special needs and disabled groups were also identified as citizens requiring more specific focus by

DI initiatives. The typically digitally excluded within the WC according to this study, are presented in Figure 13.

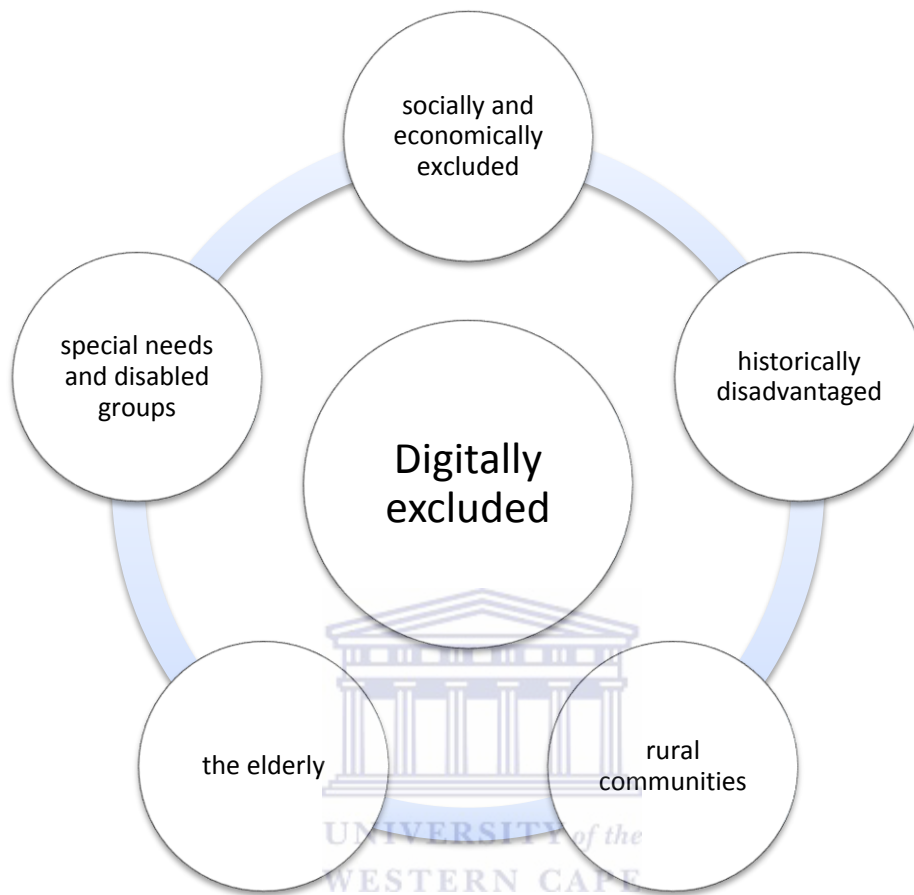


Figure 13: Digitally excluded groups (Source: Author)

The research sought to gain an understanding of the literature-based barriers to DI, which was tested in the empirical setting. The central barriers to DI as revealed through these findings are presented in **Error! Reference source not found.**Figure 14 below. The skills barrier is denoted as the focus of the study.

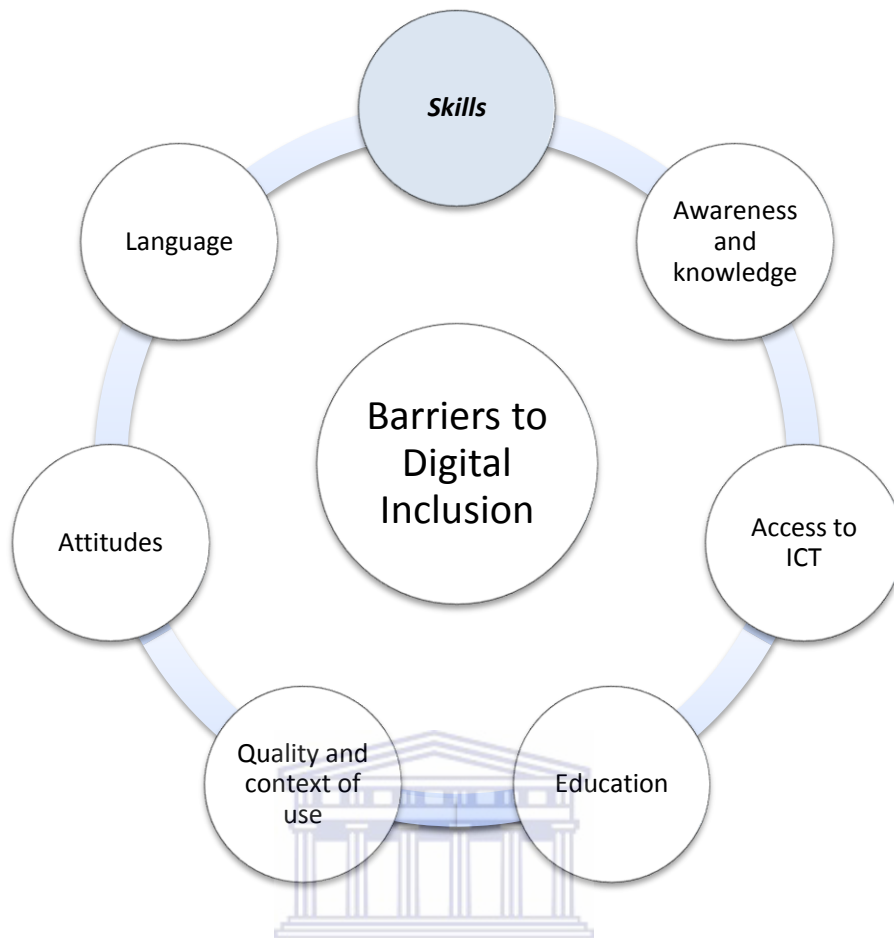


Figure 14: Barriers to Digital Inclusion (Source: Author) *the*
E-skills relevant to DI

4.2.5 Summary of Digital Inclusion

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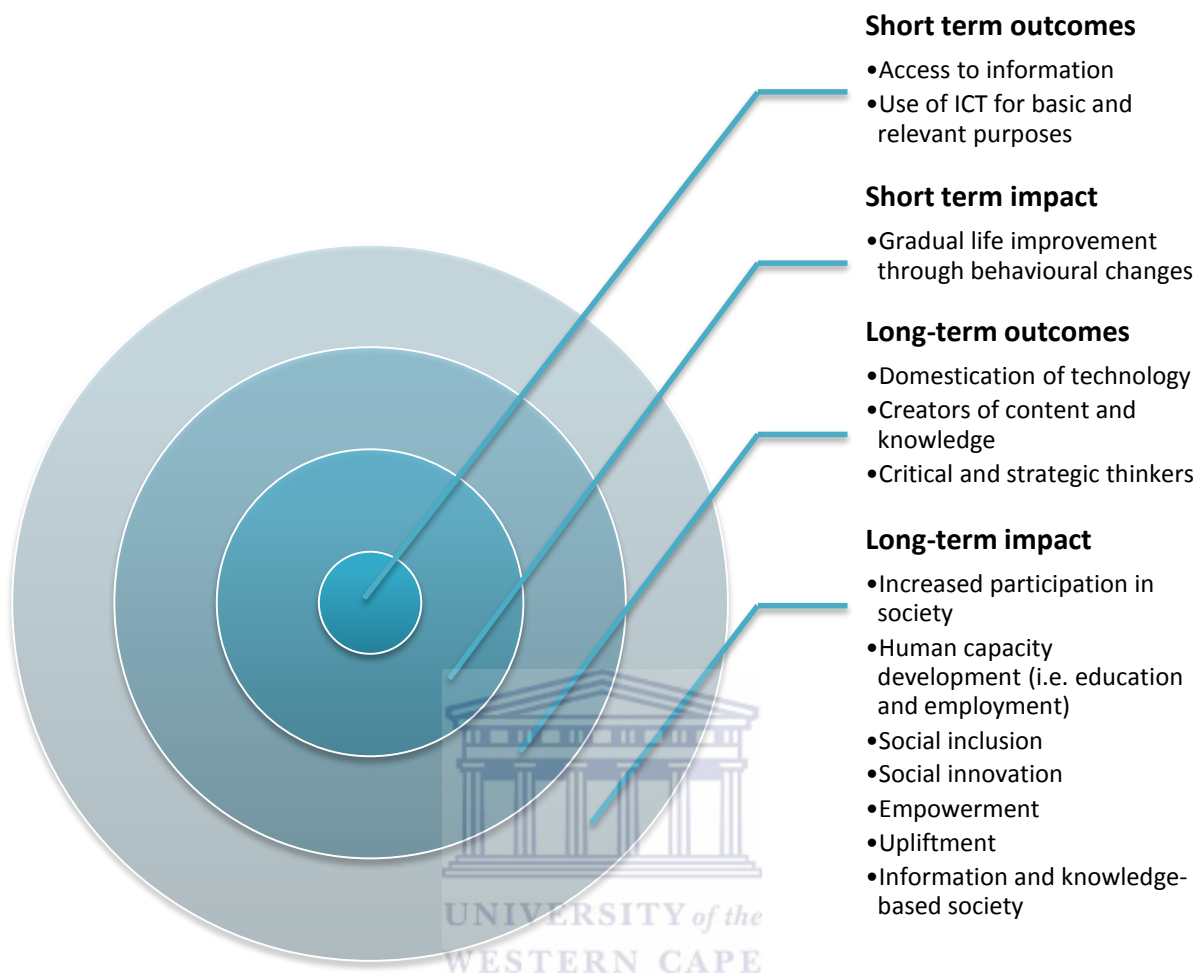


Figure 12: Conceptualisation of Digital Inclusion (Source: Author)

The literature review identified the commonly digitally excluded groups. Empirical findings then provided an understanding of which of the identified groups were generally digitally excluded within the WC. The findings suggest that the typically excluded groups are those who are historically disadvantaged, a majority of whom still struggle as a result of past circumstances. This term generally refers to ‘Black’ and ‘Coloured’, Afrikaans and isiXhosa speaking natives living in underdeveloped, geographically remote or rural areas. While these groups are also typically the socially and economically disadvantaged, social and economic exclusion is not limited to them. Similarly, rural areas are not entirely composed of underprivileged groups. However, lack of infrastructure and technological penetration into these areas may leave others equally as excluded. Finally, the elderly and special needs and disabled groups were also identified as citizens requiring more specific focus by

DI initiatives. The typically digitally excluded within the WC according to this study, are presented in Figure 13.

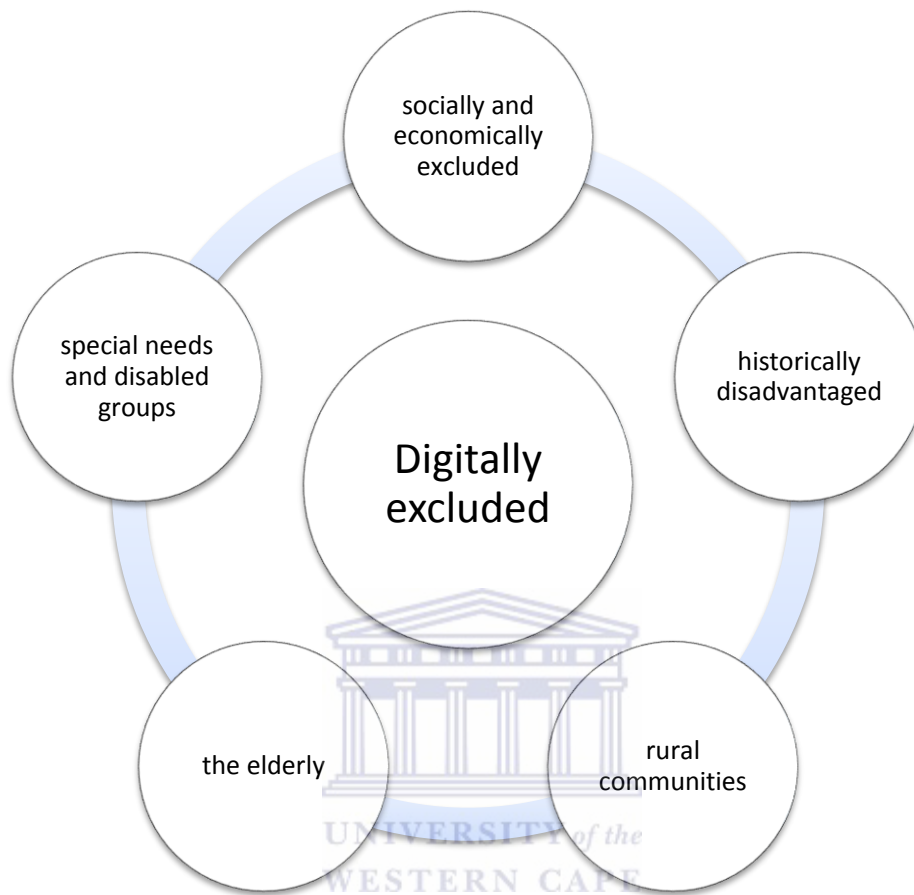


Figure 13: Digitally excluded groups (Source: Author)

The research sought to gain an understanding of the literature-based barriers to DI, which was tested in the empirical setting. The central barriers to DI as revealed through these findings are presented in **Error! Reference source not found.** Figure 4 below. The skills barrier is denoted as the focus of the study.

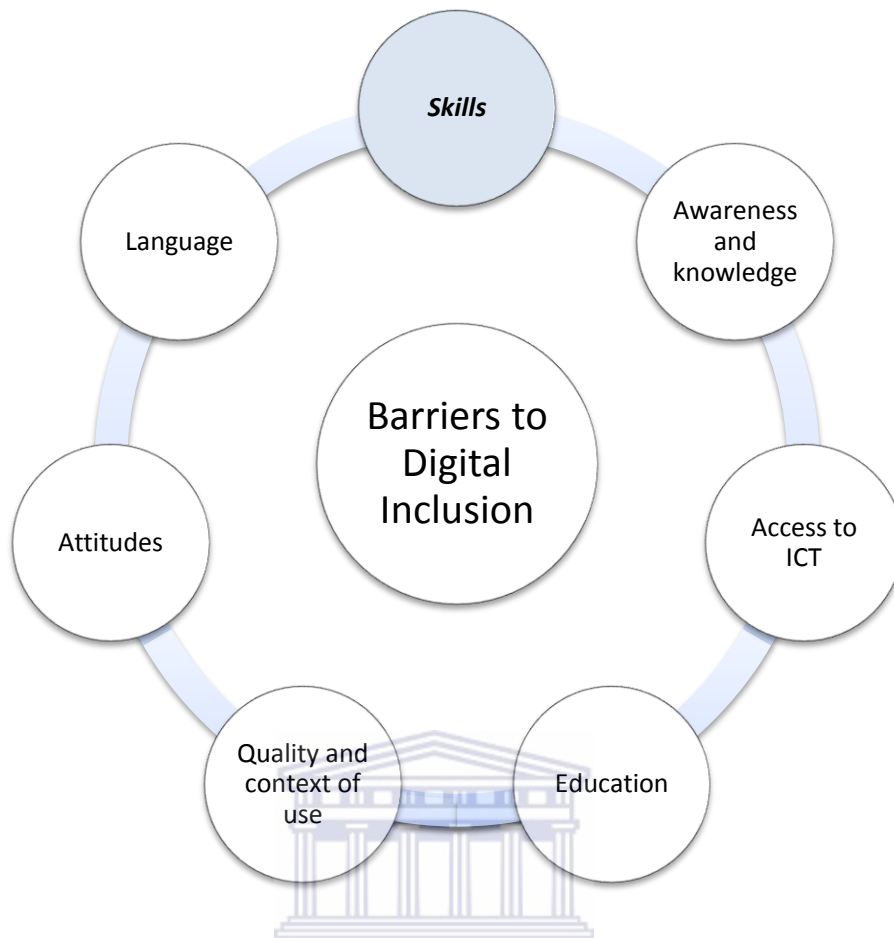


Figure 14: Barriers to Digital Inclusion (Source: Author)

4.3 E-skills relevant to DI

This section analyses the e-skills which are necessary for DI, in light of the understandings and intentions discussed in 4.2.1. It explores which of the literature-based e-skills summarised in Table 12 are relevant and need to be developed to achieve the defined DI conceptualisation in the WC. It discusses which of these e-skills have been included in the WC e-skilling context, how they have been grasped and adopted by the trainees, and to what extent these e-skills exist or are absent in the marginalised communities.

4.3.1 Digital Awareness

Digital awareness was identified as an essential component in the literature on e-skills related frameworks. The discussion in 4.2.3.1 included attention to lack of awareness as an important barrier to DI. The main empirical findings related to this are outlined below.

Interviews revealed that there was a general awareness of the pervasiveness of ICT and information resources amongst marginalised communities but only partial awareness of the existence of various e-skills and of the legal and ethical issues involved in digital media. Interviews also revealed only limited awareness of the possible benefits of ICT. Advertising and providing much needed knowledge of these benefits may encourage these members of marginalised communities to overcome their reluctance to engage with ICT and become digitally included. Greater digital awareness seems vital if the intended DI objectives as defined by both the reviewed literature and WC e-skills providers are to be attained. This element is included in the conceptual model.

4.3.2 Basic literacy

As in reviewed literature (see Table 2.12), analysis of interviews with both the supply and demand ends confirmed basic literacy as an important component of e-skills for DI. A provider relayed a sort of co-dependence between this ability and using ICT:

Research indicates... [that] your level of education and literacy will allow you to optimise ICT to a certain level and then you will get stuck because you don't have the education and – what normally happens [is] – there's a study I think it's a World Bank [study], that indicates then when you've optimised your ability, then you actually start to use ICT to enhance your education and once you've enhanced your education that enables you again to utilise ICT to the next extent. (Provider 3)

This indicates that basic literacy does indeed play an important role in the use of ICT and vice versa. The importance of basic literacy was confirmed by a trainee who provides e-skills training to local community members:

As for numeracy and literacy... yes we have a problem with that as well because... you need to be able to type, you need to be able to spell... If they don't understand the question then they can't perform the task. (Trainee 2)

This view highlights the nature of basic literacy as fundamental to or underpinning the development of other abilities (Selwyn & Facer, 2007). This trainee stated that they see basic literacy as the key to being able to undergo training and use ICT.

Accordingly, that particular community e-centre's policy limits training to those who have completed secondary education (grade 12), assuming that they would have an adequate level of literacy. At present, this criterion is not strictly enforced, which has posed a definite challenge to the centre according to this trainee, who is responsible for training community members. The challenge was also personally felt by two trainees, who required additional assistance from the facilitators during training as a result of reading or writing difficulties. Even those competent in basic literacy could attest to the problem low levels of literacy pose. One trainee described how many of the elderly centre users in the community "*can't read or write and we have to help them, like literally help them find information*". (Trainee 6)

Considering the fact that most trainees mentioned the ease with which young children, likely to have limited basic literacy, use their centre facilities, it is probable that basic literacy poses a bigger barrier to information literacy than the actual operational skills required to use ICT. Nevertheless, the findings of the empirical research correspond with the literature in considering basic literacy an essential component of the e-skills required for DI.

4.3.3 Technological literacy

4.3.3.1 Operational skills

Operational skills have been defined in many ways and consist of a range of components, according to different sources of literature. This research has opted to consider this as the ability to interact with hardware, software, networks and various communication devices, understanding the context and purpose of use (Ala-Mutka, 2011; Chinien & Boutin, 2011; Ferrari, 2012; Romani, 2009a; Van Deursen & Van Dijk, 2009).

Interviews revealed levels of operational skills to be relatively low amongst the larger e-centre employee population trained at the WC CoLab (according to providers) and amongst the WC communities (according to trainees). Most trainees admitted to having had very basic levels of operational skills prior to training. Being e-centre employees, they were all familiar with the basic functions of computers and the Internet. They were, however, much less acquainted with relatively common software, e.g. PowerPoint or Excel, both of which were included in the e-skills

training tasks (see Appendix D). Only one of the interviewed trainees reported making use of this software prior to training. The providers noted that for many of the trained e-centre employees, “...when they came to the training, their basic [skills] was just typing. That was what they taught [at their local community e-centres] and they themselves couldn’t even type nicely” (Provider 1). Another provider voiced how “...facilitators had to be latched on to some people sometimes because some of those basic skills were not there, even though they had rated themselves as having basic skills” (Provider 2).

The trainees were able to provide a sense of these skill levels in the communities and there was an overwhelming consensus that there was a lack of operational skills, even when interviewees did not directly state this. One trainee, for instance, gave the following description when questioned about daily activities at the centre and what services users most request or require:

Most of them just come for making photocopies or print outs and what we do these days [is] we help them if there’s an email address with that fax they want to send. We help them to like in use the computer to send an email rather than sending a fax. That’s... some of the stuff we really use. (Trainee 6)

This leaves the impression that a substantial number of this community’s members are unable to perform a seemingly basic operational task such as sending an email. In addition, according to this e-centre employee, computer and Internet access within this particular community is poor and the only other public access point (apart from this centre) was very recently established and charges for its services. This makes the previous extract a matter of more concern given that this e-centre is probably the only real point of online interaction for much of the community, yet the technology appears to be largely unused by many who remain dependent on older, more outdated ICT. This suggests the lack of operational skills in this community.

Other e-centre employees were more direct in their beliefs concerning the centre users: “They actually don’t know how to operate a computer... [They] don’t know how to type.” (Trainee 8) This trainee continued by describing how an intern in the e-centre, a young community member appointed by the WC government, was

completely unable to function on a computer in order to carry out basic administration duties.

...my work involves a lot of working on the computer [and] she didn't know anything. So we had to incorporate her there fast to make sure she has the skills in order to work with the people because I mean... it's senseless for you to bring somebody... who doesn't know how to type yet you ask her to sit there with the administrator [and] she's expected to type CV's for the community; she's supposed to help with the admin work. She needs to have some basic computer knowledge.... (Trainee 8)

The fact that the poorly skilled individual in question was a young adult, recently out of school, is a matter of concern because it is an indication of the low operational skill levels in the community. Another trainee added that when taught, his community e-centre users really struggle: “...*some of them, they do not know even the basics of computers and then when we train them... it's difficult for them. It was difficult*” (Trainee 7). This individual also admitted to personally struggling in acquiring these basic technological skills. In contrast, most trainees mentioned the ease with which children took to the computers and other ICT reinforcing the validity of the “digital natives” term used to describe them in the literature (Ala-Mutka, 2011, p. 21).

Although many members of marginalised WC communities lack the operational skills necessary to use computers, this is not necessarily true for all forms of ICT. One trainee describes using her mobile phone to complete one of the e-skills assigned tasks when the computer recording tool intended for use failed to work. There was also consensus amongst the entire sample group that many community members are active on some form of social network through mobile phones. This alludes to the ubiquity of cellular phones in the WC, and South Africa as a whole. It also implies that although people may be lacking basic computer skills, they are familiar with other communication mediums particularly mobile technology and are able to perform basic tasks in this manner. The significance of this within the DI context was aptly summed up by an e-skills provider who stated that WC citizens “*must have the ability to manage the different mediums to be an effective knowledge worker*” (Provider 3).

A final finding regarding operational skills was revealed by a provider who described how the e-centre employees, who were already equipped with operational skills or had taken a course in basic computer literacy such as ICDL, were engaged in the e-skills course at a higher level. Instead of concentrating on basic technical aspects like “*copying and pasting*”, they were focused on the benefits they could derive from the application of the newly acquired skills:

...they were not so much focused on basic copying and pasting and they were more engaged in producing their marketing material for e-centres... We can definitely see that those that come with basic ICT skills, that person is definitely a more engaged student than somebody that's still embarrassed because they struggling with those basic ICT skills. (Provider 2)

In summary, according to the literature and empirical findings of this study, having operational skills plays a pertinent role in deriving the benefits of using ICT and those equipped with higher levels of basic technological skills are more capable of focusing on the potential opportunities of the technology. The interview findings also indicate that operational skills are generally lacking in marginalised WC communities, reinforcing the significance of the development of these skills and the inclusion of this component in the developing conceptual model.

4.3.3.2 Navigation skills

According to reviewed literature (Van Deursen & Van Dijk, 2008; Van Deursen, 2010), navigation skills are believed to be an integral component of the required skills for modern society, because the nature of media has changed from the more controlled linear flow of information of the past, to the non-linear – often very confusing and unpredictable – structure of the main source of information today: the Internet. More simply put, these skills relate to “the ability to efficiently and effectively find information on the Web” (Hargittai, 2002, p. 1).

These abilities were actively addressed in the e-skills training (evident in Appendix D), although the entire sample reported this to be a challenge in marginalised WC communities. One trainee referred to community members as “*overwhelmed*” where these Internet navigation skills are concerned, while another appears to have such little faith in the ability of the centre users, he prefers they immediately approach him

for assistance upon entering the centre advising: *“If you want something, write it down, don’t check everything cause it [the Internet] tries to confuse you”* (Trainee 4). This perhaps alludes to a less than positive view of technology in the trainee himself and one that is being transferred to his respective community members. Others, however, view that this is only a problem for *“beginners”* (Trainee 1) and that:

If you learn how to search or if you are taught how to search or just instructed or guided then you can use the Internet more efficiently. Two people will search for the same item and the one will get it in five minutes and the other will take half hour and it might not even be the correct information... but with practise you learn which links to ignore, things like that” (Trainee 2).

This subject of “practise” corresponds with literature (Hargittai, 2002), which suggests that navigation skills are directly linked to time spent on (which requires access to) the medium. Providers too are acutely aware that marginalised WC communities generally lack Internet navigation skills. The tension between the need to practise these abilities and the limited resources they have available plays a role in maintaining and furthering exclusion of these groups:

You telling the people to search the Internet, by the time they find a link, the R10 is up... our people don’t have money, now you telling them search... The web can get out of control. (Provider 2)

E-centre employees also noted that those with a higher level of operational skills performed better in activities specifically requiring navigation skills, while those with little or no operational skills require a great deal of assistance in this area. This is directly related to the issue of time, experience and access to ICT. The fact that many community members appear to require assistance may be another indicator of poor operational skills in the marginalised areas of the WC province. Children, on the other hand, were reported to have less difficulty than adults in terms of navigation skills:

Ons is eindlik verbaas veral met die kleineres. Hulle wys eindlik vir jou baie goedte, hulle struggle nie. Hulle is baie slim. [Translated: “We are actually surprised, especially with the small ones. They actually show you many things, they don’t struggle. They are very clever.”] (Trainee 5)

The relationship between age and navigation skills has been reported by other sources such as Van Deursen (2010), who mentions that the difficulties in this regard are often experienced by the elderly. In this research, age also proved to be a factor. One provider reported that an older cohort had poor Internet navigation skills:

I would say half of the first pilot, they were not that skilled in this but with the other groups we had this year, we found the trainees came and their knowledge and skills level were a bit better so they could stay focused on if you looking for this specific thing, you going to focus on it and get your end result... I think it could be age related. The first group we had was a little older than the groups we had this year... (Provider 1)

Interviews have confirmed that certain WC communities find navigation skills, specifically Internet navigation skills, difficult to acquire and that limited resources and access make the challenge even greater. Since the Internet is the primary source of information today, understanding its structure and being able to navigate one's way around are vital (Van Deursen & Van Dijk, 2008). The empirical findings support this, but have found that with some training or instruction "you can use the Internet more efficiently" (Trainee 2) to become "an effective knowledge worker" (Provider 3). The conceptual model will therefore include navigational skills, believed to be necessary for DI. They should enjoy much more attention in the WC province.

4.3.3.3 Security skills

From the trainees' account, it appears that security skills were not specifically addressed in the CoLab e-skills training. There is also no mention of this in the training programme (see Appendix D). Although basically all interviewed e-centre employees stated that they were competent in this aspect, some appeared very hesitant. One of the few trainees who delivered training to community members confirmed these skills as important and the first element taught to users in her local e-centre. This importance was confirmed by a provider who reported that security skills were found to be generally low amongst trainees, many of whom were unaware of issues such as slow computers due to lack of anti-virus software. In addition, this provider also described a fear which many of the e-centre employees had relating to privacy on the Internet, particularly social media, which was consequently discussed:

A lot of them had concerns, 'no I don't want everyone seeing my stuff' and 'I'm not going on Facebook for this and this reason' so there were a few misconceptions about the social networking environment. It was explained that you must be conscious about what you put up so we showed them about the settings, privacy and all of that. (Provider 1)

While it appears that people have some degree of knowledge as to the risks accompanied by technology, they lack the skills and knowledge to take active measures against these. As a result, this has prevented some from fully participating socially as well as posing a host of other future risks. For these reasons, security skills are considered important for inclusion in the conceptual model.

4.3.4 Information literacy

This has been emphasised as a critical e-skills component in literature, understandably so given the global focus on building an information and knowledge-based society (Bianchi et al., 2006; Tapscott, 2012). The empirical research found that considerable attention was paid to information literacy within the CoLab's e-skills training. Specific modules and assignments were dedicated to what a provider termed "*information management packaging*". This included the following activities (see Appendix D):

- Browse and search through existing library information/resource bank collated by facilitators;
- Identify a need within own community and search for related information to be added to the existing library
 - Browse the web for related material/information
 - Update information (Copy, paste, and edit information)
 - Insert into existing library

This correlates with the processes described in literature (Eshet-Alkalai & Chajut, 2010; Ferrari, 2012; Romani, 2009a; Van Deursen & Van Dijk 2009 etc.), namely the ability to understand what information is relevant and fitting to the context, locate, interpret, organise, integrate, evaluate and finally apply it. Most interviewed trainees reported no problems with these information related aspects. However, a small

number appeared doubtful and one seemed unable to make a distinction between these cognitive information processing abilities as opposed to the more technical operational skills required to operate ICT devices. This individual also admitted to struggling with the above listed information processing tasks but was unable to articulate the reason. The trainee had previously acknowledged difficulties with basic literacy, which could be closely related to difficulty with information literacy, as this would require certain reading and writing capabilities. Another trainee, with more ICT experience also drew a connection between these two skills, considering information literacy difficulties to be due to poor basic literacy. He explained the situation within his own centre:

We have a problem with it [information literacy] because we have low [basic] literacy skills of the guys that come here. Specifically this year was a bad year. The education level is low so they don't understand the question, so they can't get through the task... comprehension is a big problem because they read questions and they don't understand what they must do. (Trainee 2)

This confirms that information literacy is closely related to the barrier of education levels in the sense that not only basic literacy but also integral cognitive skills are expected to be developed in prior education. These are then combined with technological literacy acquired during training, to further learning. The challenge according to this trainee is that many of these WC citizens approaching the centres have not had sufficient education to develop these skills. As a result the e-skills training process is more complex and challenging.

Many of the trainees reported that their respective community members did not have much ability to search for and locate information. It appears that it was the school children who generally used the Internet for this purpose. Almost all of the e-centre employees who were interviewed reported that the dominant activity at the centres was completing school assignments. One cannot conclude that the school children are fully competent in these skills, but it implies that they are spending more time developing these competences. The organisation and integration of information also proved to be a challenge. One e-centre employee admitted that along with community members, he too finds this challenging:

I'm struggling with that one. Take in [information from] the Internet, want to combine all of this... and I'm like hey ha-ah [no]! I'm struggling but I try to force [myself]. (Trainee 4)

The largely cognitive nature of information literacy was recognised by providers and a few of the interviewed e-centre employees, some of whom actually directly stated how “*the thinking part*” (Trainee 5) was more difficult than the operational skills or “*button knowledge*” (Van Dijk, 2013). One trainee spoke of the extended thinking and effort, as well as time that information literacy required:

It's time consuming cause you have to look in different avenues and see what's relevant so the only problem I think I had was that it's time consuming... I just had to put in more effort to complete that. (Trainee 3)

Findings were mixed regarding trainees' ability to identify the information that was relevant to their specific task. They experienced even more difficulty when analysis and evaluation were required. When requested to collect information related to their particular local e-centres, summarise, analyse and evaluate findings to draw certain conclusions, results were poor:

...in terms of analysing, documenting and discussing the feedback they received, that was very weak actually. They didn't really grasp the concept of discussing or writing a summary of people being interviewed, what does it say about the questions you asked and the feedback you got, how can you use that information to update your training programmes or increase the services you offer in the e-centre. They didn't really get the concept of discussing and writing that so that's, I would say, a sort of a weakness in this stage. (Provider 1)

This directly relates to the ability to think critically, which was identified as a matter of concern. However, since it is not only related to information literacy, it will be discussed in 4.3.9.

While other e-skills may be more controversial, all of the literature consulted saw information literacy as a necessity. The empirical research produced similar findings: each of the specified information processes is included in the e-skills training. People

living in marginalised communities generally lacked these cognitive skills, perhaps this is not surprising given the low education and basic literacy levels in these communities. Much more attention should be given to developing these skills as they are specifically required to achieve the short-term outcomes of DI, namely enabling citizens to access and effectively use information. Furthermore, they are a pre-requisite for attaining the broader DI goal of formulating an information and knowledge-based society.

4.3.5 Media literacy

Interviews revealed that trainees as well as community e-centre users in general remain quite traditional in their choice of media. Digital platforms for example, were rarely mentioned as a means of receiving the news, weather, or for educational (with the exception of school children) or entertainment purposes, besides the social dimension of social networking. The form of social media which e-centre employees (and according to them, their community members) participated in, was limited to virtually only 'Facebook' although it was noted that mobile instant messaging services – predominantly the older Mxit forum and to a lesser extent the more recent Whatsapp – were fairly popular amongst younger people. One trainee reported using YouTube, and a community member was found viewing an online film at another centre. These indicate some degree of awareness of the changes the media have undergone. The 'new' media in use in these communities, as was repeatedly noted in interviews, are online employment search spaces or what numerous trainees referred to as "*job websites*". Overall, the research did not clarify whether e-centre employees or their respective community members really give any thought to the nature of media, understand underlying intentions or discriminate between content. However, this is doubtful given the general lack of evaluation and critical thinking competences in evidence.

The WC CoLab e-skills training programme focuses on managing media materials or working with various platforms. This is evident in the inclusion of assignments such as the following (see Appendix D):

- Download video files and save as different video formats
- Make use of video download list

- Convert multiple video files to one standard video format.

Providers reported that many e-centre users had limited knowledge and skills in this area, but the interviews revealed that trainees perceived it as most beneficial. Even those who entered with higher levels of general e-skills or more digital experience improved their media-related skills as a result of the training. One provider attempted to explain this by saying that some trainees knew how to use PowerPoint but were unaware that they could incorporate sound. Managing various forms of media was a challenge for certain trainees. One e-skills provider reported that “*even though some of them said they had ICT skills, you would find with the digital stories they struggled*” (Provider 2). Digital stories in this context require the management and integration of a wide range of electronic media platforms.

Very few admitted having had difficulty in dealing with digital media formats. Those who did admit to finding this challenging generally referred to the process of managing multiple media formats simultaneously, e.g. integrating text, video, graphics, audio etc. One trainee animatedly expressed this difficulty: “*...to put all together hey! Confused me! It's too much!*” (Trainee 4) The provider who had raised the issue of age with regard to technological literacy mentioned this again regarding media skills. She observed that these difficulties may be more prominent within older individuals as later, younger cohorts fared better.

Finding the precise reason is beyond the scope of this research. However, the provider speculated that the reason for older people having greater difficulty in managing and integrating different media platforms was that their operational skills were less developed. It may also be possible that older people are accustomed to using more traditional forms of media and so require more time to familiarise themselves with and make the transition to digital platforms.

Most trainees thoroughly enjoyed this section of the training, even those who mentioned the time and effort involved. They found working with combinations of different media interesting and mentally stimulating. One individual commented:

It's nice, for me it's nice. It's not just one thing or form, it's different forms... we had to use voice, photos, everything... it's nice when it's not just one [media format]. (Trainee 1)

Those equipped with more e-skills prior to the training, appear to have benefitted more from the media focused aspects of the course than any other section. These trainees, who had already possessed adequate technological and information literacy skills, tended to find most use for the media literacy enhancement and were able to derive real benefits from these, which they could put to use outside the training context. One such trainee, who regularly works with digital formats, transferred newly acquired media literacy capabilities to his professional activities to enhance presentations. Interestingly, media literacy skills also appeared to make the most prominent difference post-training for those who had entered with lower e-skill levels and are being used in ways which are relevant not only to these individuals but also their communities:

They showed us quite a few stuff that we do now. We had our concert with the children and we made them collages and it had a nice effect because it was different and the parents were shocked. (Trainee 3)

One could also deduce from the “*shocked*” reaction of the parents that there is little exposure to this sort of media format in many WC communities. This suggests that there is not much interaction with various digital media and reaffirms the importance of this skill development. Another trainee who delivers e-skills training in her own community also reported that the media component is what really captures the attention of the centre users who appear to notice visible effects and benefits from these particular skills. She used an example of a recently trained centre user who “*is actually doing photography as we speak so I think the digital photo-stories and all of that did help him*” (Trainee 8).

Empirical research found that the WC CoLab’s e-skills training emphasizes the significance of media literacy: a large portion of the curriculum is dedicated to the development of these skills. The training attempts to build the capacities of the trainees to “deal with information ‘pushed’ at the user, in a variety of formats” such as graphic, audio, text, video etc. as prescribed by Bawden (2008), as well as the bulk of other media literacy related literature. The empirical findings, like the literature, illustrate the relevance of media literacy for DI purposes. A number of trainees used these formats for personal and professionally relevant tasks. The changing nature of the media, with its abundance of user-generated content has

increased the need for media literacy and critical evaluation of content. Members of the WC communities, who still appear to be very traditional in this regard, need to familiarise themselves with the new media platforms so they will be more willing to use them and increase their participation in society. The rationale for the inclusion of media literacy in the conceptual model is particularly evident in the following finding extract from an interview:

We live in a 21st century which is a digital knowledge economy, which means to be effective now you have to have digital competence which means it's more, I'm more inclined to go towards media literacy. Years ago we had to read, you had to be able to read books. Now we have to understand technology, all technologies as in media and have the skills to use all of those media effectively, that's how I regard e-skills. (Provider 3)

4.3.6 Communication and collaboration

According to the e-skills providers, DI prioritises sharing information and knowledge, which makes communication and collaboration vital. The literature review reveals that people require the skills to share or communicate through ICT (Ferrari, 2012; Martin & Grudziecki, 2006) in addition to sharing information orally. E-skills providers have stressed the importance of collaboration and incorporated it into much of the programme in an attempt to instil this culture in communities. According to the providers, many trainees across cohorts were unfamiliar with this concept of teamwork and sharing information. One provider firmly believes that this is a matter of mind-set. She feels that anti-collaboration mind-sets are the result of being in a marginalised community where resources are scarce. Citizens are inclined to be competitive and therefore guard what they have and are unwilling to share knowledge. This empirical finding therefore connects collaboration to attitude, reinforcing the barrier discussed in 4.2.3.5. The following extract attempts to explain this and shows how important it is to instil a culture of sharing:

I think maybe people behave like this because... when there's a scarcity of resources you compete, maybe that's part of it... We need to understand and that's the mind shift, if we collaborate we've got a much better chance of succeeding than competing one-on-one but that's a skill we should develop

from toddler phase... I think it's a critical element that we need to [change]... or mind shift change. (Provider 3)

Most of the trainees that were interviewed appeared to have an open and positive attitude towards collaboration and knowledge sharing, as is evident in comments such as:

Why should I keep the skills for myself? I learned to transfer the skills to somebody else, so we try to do that. (Trainee 8)

The networking, which occurred during both face-to-face and online phases, was also an indication of the communication capabilities of the trainees, both in person and through the use of social media. Findings indicate that networking may be impeded or limited when trainees are previously acquainted, in this case employees from the same centre. Some who came as individuals were forced to – and did – connect with other trainees. However, the trainees who entered as pairs appeared to be closed to this and collaborated only with each other. As one trainee stated: “*We had each other so we [are] enough.*” (Trainee 1)

The e-skills providers attempted to develop the virtual communication and collaboration skills of trainees as well, considering these essential skills in modern society. During the interviews, trainees reported appreciating the freedom of expression in sharing their information, provided to them through the different digital communication avenues to which they had been introduced. One trainee put it this way:

...everyone had free choice [as to] how they want to present their story so it was nice to see what the others did. We were free to do whatever so I think people expressed themselves better... Everyone had a different approach. (Trainee 3)

As experts on their own respective communities and centre users, the trainees were able to provide valuable knowledge on the needs of local citizens. They identified a need for knowledge sharing skills like how to prepare a presentation using ICT, and communicate and express information digitally. These skills are needed by a range

of different members of the community, including school children and professionals. One e-centre employee explained:

We have a lot of businessmen coming in here who have to do their business proposals and what we have done there [at the WC CoLab], we could have helped them with that information.” (Trainee 6)

Interviews revealed that trainees struggled with certain aspects of the communication-related activities, in both oral and online form. Social media were not generally listed, but one trainee reported that the discussion forums proved to be problematic for certain fellow learners. An interview with another revealed that the little virtual communication and collaboration which did take place during training did not prove to be very productive. Trainees struggled to separate the social context of the communication from using the online medium to complete the task at hand. Where personal, face-to-face communication was concerned, trainees again had no problem with the social aspect, but struggled to communicate and express information more formally in the form of oral presentations. However, even those who admitted to being extremely nervous and embarrassed believed that this was a necessary skill in society today, which needed to be developed:

Ek dink dis voordelig vir ons wat so baie skaam is om voor mense te praat.
[Translation: I think it's beneficial for those of us who are very shy to speak in front of people]. (Trainee 5)

Others believe that the training developed communication skills, which they could use within their daily professional context as well:

...they teach us how to behave with people and how to communicate with people. Do not shout in front of them, take the person outside and tell them what's right and wrong. (Trainee 7)

The trainees took great pleasure in their newly acquired digital communication skills, even in face-to-face settings. However, some of the very shy trainees opted to use these new digital skills to give others information about their product rather than struggling to talk about it, as one explained: *“I was shy... I didn't want to speak so I just used audio”* (Trainee 3). Although oral skills are still very important in society as

stated, earlier, the fact that these individuals were able to use ICT and e-skills to communicate and express information in ways that simplify their own lives and experiences is directly aligned to the DI intentions identified by providers.

The data collected during the interviews with WC e-skills supply and demand resonate with the literature, which considers communication and collaboration fundamental aspects and intentions of the digital era and information and knowledge-based society. It has therefore been included in the conceptual model.

4.3.7 Real-time thinking

Virtual, interactive multimedia require processing of many stimuli at high speeds, making sense of them as a coherent whole, followed by some form of immediate response (Eshet-Alkalai, 2008). Interviews revealed that there is extremely little use of this (more modern) form of technology in marginalised WC communities where the nature of ICT usage is very basic. Examination of the training curriculum revealed that trainees were introduced to virtual environments (see Appendix D) to encourage the development of real-time thinking. These platforms were new to eight of the ten interviewed trainees. Only one of the remaining two used them. Certain trainees reported struggling with the virtual interaction. One explained the challenge experienced in simultaneously integrating the skills needed to manage the incoming stimuli: *“When I’m talking that one is also talking and I think we forgot how to use WebEx...”* (Trainee 9)

This gives the impression of a rather unproductive interaction. Given that the goal of this particular skill according to Eshet-Alkalai & Chajut (2010, p. 174) is for *“users to perform **effectively** in these environments”*, it appears that these abilities require much more development through engagement with virtual platforms. It should also be stressed that the previously quoted trainee was one of very few who was afforded an opportunity to engage in this kind of interaction because of Internet connection difficulties. The issue of connectivity is particularly significant in this context as it leads one to question the current relevance of real-time thinking in areas where poor Internet access makes interacting ‘live’ a considerable challenge. A provider, however, thought this issue of functioning in real time was important, as observed in her statement providing an example of what she believed was currently relevant in training: *“...teach [the trainee] all the Google drive tools where she can now share in*

real time with her other colleagues in other centres" (Provider 2). One of the most commonly reported uses of the community e-centres according to trainees, was local children playing games, which entails a certain degree of these real-time skills. Games are also used to teach e-skills to children in one of the local community e-centres, as this was recognised as a useful means of capturing and maintaining their interest. The nature of modern digital games have evolved to a huge online 'live' platform. Certain trainees reported that the children were participating in games via the Internet at their centres, however the poor connectivity in these areas makes this information difficult to interpret. Nevertheless, given the almost non-existent use of virtual interaction by adult users in these centres, where the main uses of ICT are largely printing, e-mail, school assignments, photocopying and laminating documents (Stoltenkamp et al., 2013), it is reasonable to conclude that largely the only form of real-time thinking in these communities is being practised by young people. This is amplified by the fact that such a great deal of the adults in these communities lack general operational skills (a prerequisite for real-time thinking skills in the digital context).

The overall low (basic) e-skills levels and connection difficulties in many WC communities, as well as the CoLab's intention to uplift individuals in simple meaningful ways, may appear to support the exclusion of real-time thinking skills from a WC model. However, the fact that these skills are being used by local children (a substantial demographic of e-centre users), as well as the increasingly rapid transition of digital interaction from static to virtual, interactive and live platforms make real-time thinking skills necessary. Excluding them from an e-skills model runs the risk of widening the digital divide. While already digitally engaged groups would advance through their interaction with innovative interactive platforms, marginalised groups would be restricted to curriculums which only develop basic (often outdated) skills. It should be noted that the inclusion of real-time thinking in the model does not imply that it is imperative for DI, as other abilities that have already been discussed may make it possible to use ICT to achieve simple, personally relevant objectives. Inevitably though, real-time thinking skills will become more necessary in these communities, given the changing digital landscape or the personal digital engagement advances of individuals.

4.3.8 Creation of content

The shift from being passive consumers to active creators of content receives considerable attention in current literature, so much so that many authors have included it as a separate category in e-skills related frameworks (Ferrari, 2012; Chinien & Boutin, 2011; Perlmutter et al., 2010). This research study discovered that the subject of content creation using ICT amongst WC citizens is an intricate and complex one. The training did require trainees to do a certain amount of organizing, integrating, editing, adapting, designing, inventing, applying or representing of digital information (Chinien & Boutin, 2011; Romani, 2009a) during the creation of digital media, as well as the contribution of content to social media, discussion forums and a specific 'information resource bank' data base. Interviews revealed that a few of the trainees had adopted the skills learnt there into their post-training activities. One was keen to display newly constructed digital collages she had created which graphically and textually illustrated the various programmes offered by her local e-centre, as well as the particular target demographic. This content was used in print and digital form to market the e-centre to the community and appeal to new people to come for training, as well as to transfer knowledge at an organizational level to municipal and city representatives. Even so, both e-skills providers as well as trainees who offer training in communities were clearly of the opinion that content creation is not a priority within WC e-skilling programmes, but rather a by-product. On the subject of user-generated content, a provider stated:

We hope it's one of the side effects, but that's not the [priority].... I would rather say it's one of the side products or one of the results and not at the moment the focus. (Provider 3).

What does appear to have been a focus was initiating a change in mind-sets and enabling people to begin to perceive themselves as "*creators of knowledge*" as a provider explained:

*Remember, this was a set of objectives, to give them skills, so that they can also start **thinking about themselves** as creators of knowledge. (Provider 2)*

Based on the data collected during the interviews, it is doubtful that all trainees had this mind-set. Some admitted difficulty in producing content, while interviews with

both providers and trainees revealed that even the creation of a questionnaire, in partial fulfilment of an assignment, proved difficult for many. In the case of other trainees, however, this “*creator of knowledge*” mind-set was in evidence during interviews as well as an accompanying sense of pride and satisfaction. The remarks of one e-centre employee clearly illustrate the positive emotions which stem from the perception of oneself as a contributor:

I think when you see your end product and you see this is what I did then you all smiles and then you get that satisfaction [because] you started from scratch... When I saw this is how my digital story looks, I was like real psyched [excited]. (Trainee 3)

Developing positive mind-sets, however, is very difficult according to a provider, who believes that the problem does not lie in a lack of knowledge amongst WC citizens, but rather a reluctance to make it known. According to this provider, this may be linked to the lack of confidence many of these marginalised citizens have in their ability to create and share knowledge as a result of their history of oppression. The provider reported that tools and skills were chosen with a view to changing these mind-sets:

This project is focusing on giving tools and making them think that they can also create knowledge, and I don't know if our people are ready yet... We have people in all [of] our communities with a wealth of knowledge. What is it about us that we don't think [that] it's good enough to be out there? I think this programme is very important for not only the e-skills, but that we should be promoting to our people that they should be starting to create knowledge themselves... It comes from Apartheid... from years of always being oppressed, feeling that we [are] not good enough. We have to take all of us to the level where we know that our knowledge is also good enough to be out there and I think if we don't do that, we are forever going to be looking for content to put in a depositary... Why can these skills that we gave our people now, why is it still not changing their mind-set, that they can also create knowledge now [by] using those tools and putting it out there? So maybe that should be a follow up programme. (Provider 2)

This implies that the project aims to gradually replace their negative mind-sets with “*creator of knowledge*” or “*contributor*” self-perceptions. However, the e-skills providers consider that these kinds of self-perceptions come with more advanced ability, which is rare in marginalised WC communities; and which cannot be attained solely through training in the more basic e-skills. According to interviews, providers see such negative attitudes as preventing the development of positive self-perception, as can be observed from the previous extract. Another provider stated that while an effort is made to address this issue during training, “*you need a certain kind of person... to be able to go that way*” (Provider 3), referring to an individual with a mentality open to learning beyond the basic operational skills, to producing and contributing content. The call for a follow-up programme to address the creation of content and particularly to change mind-sets, also points to the lack of close attention to this area in WC e-skilling programmes.

Since a main objective of DI in the WC context is enabling citizens – particularly in these marginalised communities – to use ICT to simplify their lives and address their own problems in small and meaningful ways, creation of content may seem an unnecessary addition to the appropriate e-skills required for DI in the WC. However, considering: i) the emphasis which reviewed literature places on creation of content, hopefully resulting in knowledge creation; ii) the extent to which e-skills providers have stressed the importance in developing “*creator of knowledge*” mind-sets ; iii) the positive and empowered state of mind which is evident in interviewed trainees who possess these abilities; iv) the broader DI focus of the WC CoLab on the “*upliftment and the development of the country*” (Provider 3) and on building a knowledge-based society, in which knowledge creation abilities are imperative; and finally that v) the very title of the CoLab refers to ‘Knowledge Production’; creation of content and knowledge needs to be given serious attention as a category in e-skills for DI in the WC. The fact that there is so little of this and that it is currently beyond the capacity of many in this province, those who are at all digitally engaged are largely limited to being consumers of existing digital content. Finally, an important finding from the empirical research is that an appropriate attitude and perception of oneself as a contributor and a creator of content and knowledge may play an even bigger role in these communities than the actual content production skills.

4.3.9 Transferable competences

While less frequently mentioned, certain literature (e.g. Chinien & Boutin, 2011; Ferrari, 2012) emphasises the range of non-technical skills and attitudes which enable people to participate more effectively both in and out of the digital context. Empirical research has confirmed the importance of these abilities, which one provider refers to as “*lifelong skills*” (Provider 2).

The literature sees critical thinking as playing an essential role in the digital context. The empirical findings reflect a similar view. The significance of critical thinking is illustrated by a provider who reported that: “*Digital Inclusion, first and foremost is about thinking*” (Provider 2). The digital age has brought with it an abundance of information, so much so that one e-skills provider remarked that “*there’s actually an overload of information and you need critical skills and critical ability to distinguish*” (Provider 3). A trainee, who provides community training, confirmed this by commenting that citizens need to “*know what is what; what can be trustworthy and what not, so know the difference between it*” (Trainee 2). This area of discussion was also extended by a provider to the significance of the “*ability to understand the context*” (Provider 3), which is proving to be a challenge to develop in trainees:

How do you teach people or how do you develop the skill so that they can interpret the context so if they see different documents or different mediums, which one do they use. They have to have some frame of reference to say ‘no this is more important’ or ‘this is more relevant’. (Provider 3)

Providers were all in agreement that critical thinking skills are crucial in creating a digitally inclusive society and they have attempted to incorporate tasks to develop these abilities within their programme. The complex nature of these abilities makes it difficult to measure the success achieved. For this reason one provider was unwilling to comment on the critical thinking capacities of the larger population of trained e-centre employees. Another provider, however, described tasks which she feels specifically require these skills and reported that the trainees generally performed poorly. She explained:

We do focus on [critical thinking]. They need to think about their communities... Part of the formal assessment is where they need to interview

members or users that come to their e-centres and they need to ask them about what they do, what they [are] doing within the centre, are there things [e-centre employees] can improve [on], what do people [in the community] need etc... But when it comes to analysing and doing the analysis of the actual information they receive, they not that sharp so that's still a problem area I'd say. (Provider 1)

A trainee, who conducts community training agreed with the views of this provider and reported that community members initially struggle with tasks requiring critical thinking, but improve in the course of the training process. This interviewee also felt that people do not associate any sort of deeper thinking with learning computer skills, viewing them as technical. As a result, they experience some difficulty initially when they begin training and are required to apply these more cognitive abilities. She explained:

People do not have that knowledge so it's very difficult... You need to actually think and it becomes very difficult for that person who just comes in who wants to learn [computer skills], to actually think critically. (Trainee 8)

In this manner, what appears to be basic ICT skills training may actually be contribution to the development of critical thinking. The same trainee also described how e-skills learners at the local community e-centre are specifically given the task of choosing their own content to encourage them to “*think out of the box*”. According to her, the real value in this is to attempt to stimulate creative and critical thought in these individuals or what the WC CoLab e-skills supply side referred to as “*creative thinking skills*” (Provider 3).

Another transferable skill mentioned by both providers and trainees alike is problem-solving. A provider noted that although this may appear to be a very general life skill, it is an integral part of the technological environment. Sense-making and problem-solving skills are required to use ICT in the appropriate way to achieve one of the main objectives of DI in the WC, enabling people to use technology to perform personally relevant tasks. This directly reflects the WC CoLab's conceptualisation of DI as social innovation. Problem-solving skills are essential for “...*society [to take] responsibility for developing solutions for their socio-economic problems and*

challenges...” by questioning “...‘how can you use ICT as part of the solution?’” (Provider 3) On the demand side as well, the significance of problem-solving abilities was evident in an e-centre employee’s description of assisting centre users: “*I had to sit with them and find a way cause [sic] I don’t want them to walk out now without anything. Then I had to think: ‘Now how am I going to assist this person here [with the ICT-related task]?’*” (Trainee 3)

An interview with a CoLab representative revealed that developing critical, creative and problem-solving skills is currently the biggest challenge in the province’s e-skills programme. This theme also seemed to emerge in the e-skills for DI stakeholder discussions attended by the researcher. These were generally made up of academic, government and others with vested interests. Certain parties who took part in discussions considered that the rapid pace of technological advancement meant that the programme should focus on developing cognitive competences rather than specific technical skills. This was based on the notion that WC citizens need to be able to make sense of new tools, adapt to a changing context, think critically and use technology to solve the problems that presented themselves. Interviews with providers reveal their strong belief that the programme has not sufficiently addressed the need to develop cognitive competence thus far and that further development and focus on these competences are the way forward in WC e-skills development.

Nevertheless, certain trainees did show signs of self-growth and reflection. This is illustrated in the views of one such trainee who reported: “*It’s like striving to be a better you so that’s the best life skill you can learn*” (Trainee 6). Another believed that the e-skills development enabled him to obtain better employment should he wish to do so. He commented: “*You can get another job with it but it’s stuff you need here too.*” (Trainee 1) This reinforces the providers’ DI objective of providing trainees with a learning pathway, which allows them to recognise how their skills development can be used for personal and professional growth. Instilling a culture of lifelong learning is another point of concern to e-skills providers who do not feel this has been achieved through DI programmes as yet. Provider 2 specifically commented: “*I don’t think we’ve reached where they think they are lifelong learners...*”

With the exception of Van Deursen and Van Dijk (2008), who described strategic skills as the process of targeting, working towards and reaping the benefits of a

particular goal through the use of ICT, these skills receive very little attention in the literature. A possible reason for this is that these strategic skills are implicit in many e-skills for DI frameworks, in that the proposed competences are strategically used to accomplish a certain task. This was evident in the WC CoLab training where although the term (strategic skills) was never specifically mentioned, it was embedded in the providers' objective to make e-centre employees use ICT and their new-found skills to market their e-centres and to bring about some kind of personal or collective community improvement. Using one trainee as an example, Provider 2 stated that: "...[the e-centre employee is] *still using her basic word skills but now she's thinking about her community [and] uplifting herself...*" Strategic skills or strategic thinking often goes unacknowledged. However, its place in the e-skills context is important considering ICT's role in achieving personally relevant tasks. Given that strategic skills are not specific to the ICT field, but can be used to attain a specific goal or improved position in every area of life, this component has been included under the category of transferable competences.

The non-technical skills known as transferable competences were seen as vital in the empirical research. The literature discussed in 2.3.4.4 reflects the same view. Critical thinking, which marginalised WC communities seemed to lack, require much more attention. According to a provider, even more educated WC citizens, lack these. Many business employers complain of the shortage of graduate students with transferable competences. Provider 3 reported: "...*what business is asking universities [is] 'Give us students with critical thinking skills, problem solving skills. This is what we need'...*" This provider believes that these "*higher order conceptual skills*" (Provider 3), not merely the technical skills as is currently the case in many e-skills programmes, need to be emphasised and that they should be developed in depth. It has also been revealed that many citizens are not aware of the link between using technology and critical thinking. This needs to be better known. Critical, creative and strategic thinking, problem solving and sense-making abilities and a drive towards continuous learning and self-growth are transferable competences that play a vital role in the attainment of the broader outcomes and impacts of DI, identified in both literature and empirical research. It should be noted that transferable competences require time to develop.

4.3.10 Summary of e-skills for DI

The previous discussion and analysis has shown that each of the following e-skills is relevant (to some extent) to the conceptualisation of DI (see 4.2.1): (i) Digital Awareness; (ii) Basic Literacy; (iii) Technological Literacy; (iii) Information Literacy; (iv) Media Literacy; (vi) Communication and Collaboration; (vii) Real-time thinking; (viii) Creation of content and; (ix) Transferable Competences. In the WC context, most of these e-skills were: (i) Considered necessary for DI in the view of the WC CoLab e-skills providers; (ii) Included in the WC CoLab e-skills training curriculum and; (iii) Largely lacking and requiring a great deal of further development in marginalised WC communities.

What has emerged from the analysis and discussion of reviewed literature and the empirically based findings is that e-skills for DI are clearly broader than the 'skills' definition provided in 2.3.2.2.2. This discussion of the components of e-skills has specifically revealed significant elements of knowledge and attitudes required for DI. The concept of skills is therefore considered too limited and not representative of the full range of necessary e-skills related components. For this reason, the terms '**Digital competence** for DI' and 'competence areas' will be used in the final conceptual framework. This includes knowledge, skills and attitudes.

The findings related to the component of 'Digital Awareness' (see 4.3.1) require clarification. 'Digital Awareness' refers to the knowledge component of digital competence. As such, it includes different aspects of required knowledge for DI. However the researcher sees the different aspects of awareness or knowledge discussed in this category as embedded in the conceptualisation of other competence categories that have been discussed. The awareness of ICT devices and knowledge of the context of their use, for example, is an essential element in the area of technological competence. Knowledge of how and where to access information, including an awareness of the different information sources is part of information literacy. This research will therefore include the specific knowledge elements under the appropriate digital competence component and will not include 'Digital Awareness' as a distinct and separate category.

It is evident that certain competence areas are clearly more basic and less difficult to instil than others (e.g. basic operational skills contrasted with cognitive critical thinking). However, organising the digital competence components according to a hierarchy of difficulty is a highly complex and subjective undertaking, which falls beyond the scope of this research. However, it is possible to identify (albeit loosely) the abilities relevant to the discussed short-term outcomes of DI – enabling access to information and increasing basic ICT usage. Given the conceptualisations of the various competence areas, this research deems the (i) basic; (ii) technological; (iii) information and; (iv) media competences necessary for the achievement of these direct outcomes of DI initiatives. Given the size of the social element in modern ICT usage, communication and collaboration are considered a necessary addition to this category. Although they are not really necessary to attain the short-term DI goals, the remaining digital competence areas should not be excluded from the greater digital competence for DI framework as they play a definitive role in attaining the envisioned long-term impacts.

Based on these findings, Figure 15 illustrates the digital competence components, considered necessary for inclusion in the final conceptual framework. Figure 16 distinguishes between the competences directly related to the identified short-term outcomes of DI and those which do not necessarily come into play immediately.

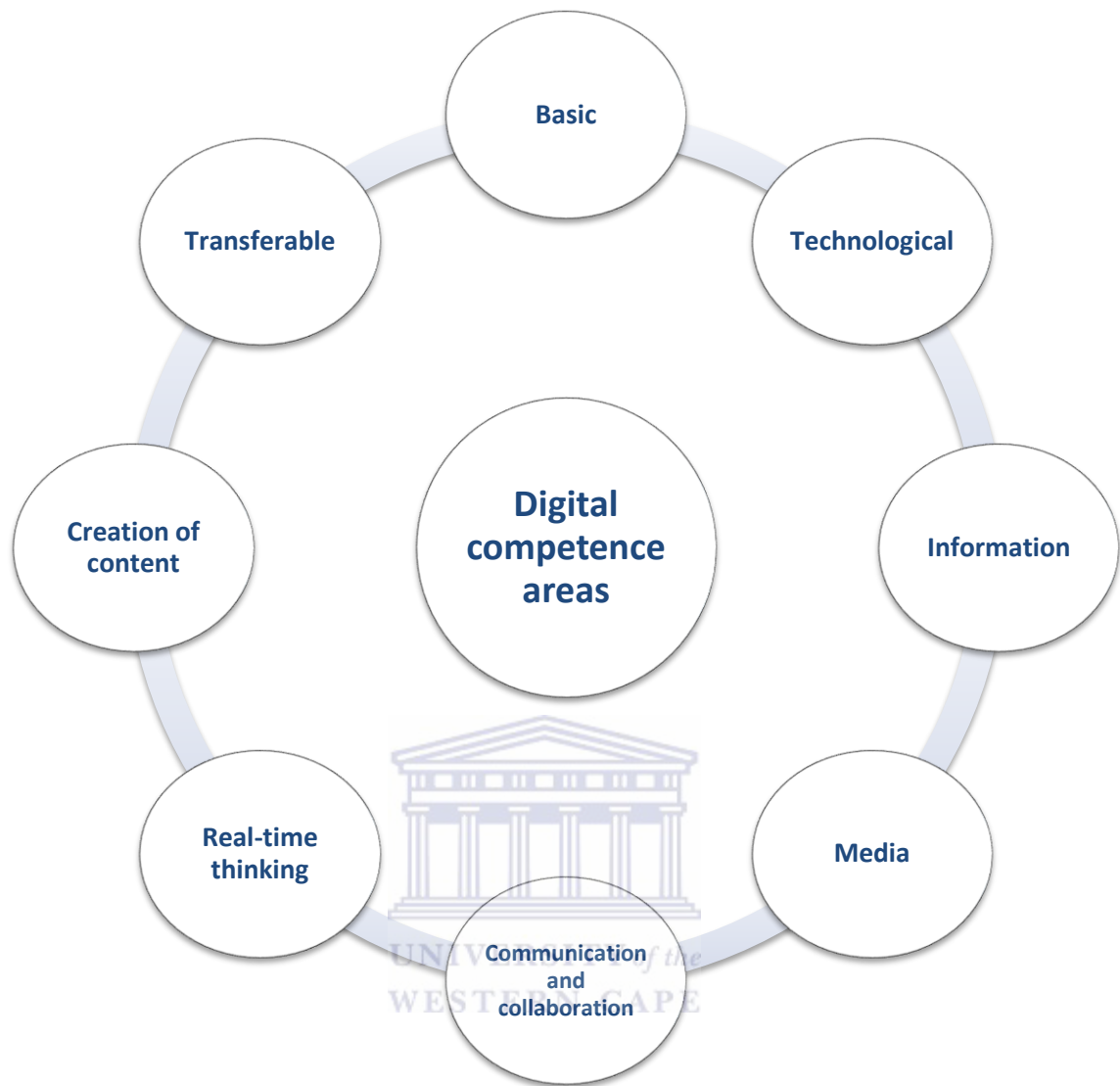


Figure 15: Digital competence areas (Source: Author)

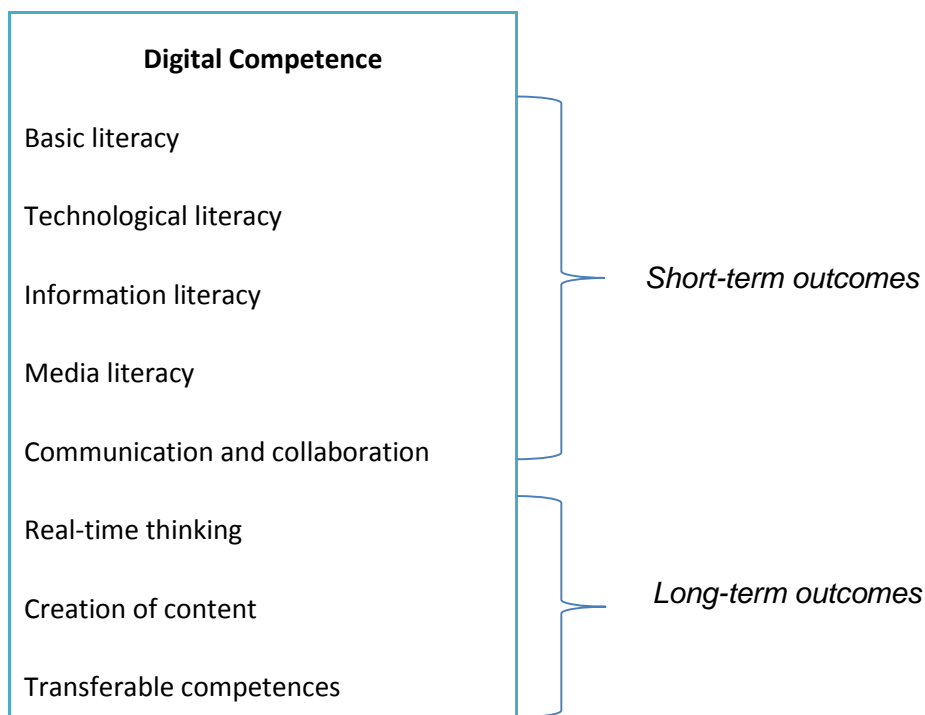


Figure 16: Outcomes-based digital competence (Source: Author)

4.4 Approach to e-skills delivery

This section explores pertinent e-skills delivery approach factors. This includes attention to each of the approach elements from the literature discussed in 2.5 that are relevant to the WC context, as well as any significant tactics revealed through empirical findings.

4.4.1 Raising awareness

Digital competence training requires public awareness of the existence and relevance of these programmes. The CoLab is conscious of this challenge, evident in research reports stating that “communities need more public awareness campaigns” and that the trainees themselves had “requested the need for public awareness across the communities related to the relevance of the eCentres” (Stoltenkamp et al., 2013, p. 3490). The CoLab therefore developed the e-skills programme based on the theme of marketing centres. While this is a valid attempt, it generally only raises existing centre users’ awareness of the range of available services; it does not have an impact on local non-users.

Digital marketing (e.g. websites; social media) is a method of raising public awareness to some degree in more established centres, one of which were included in the sample. It is the only sample case with a dedicated official website and “...a whole fundraising department and [administration]... which sorts out marketing and stuff. They look after our website and everything.” (Trainee 2) Another factor deserving consideration is that this centre is trusted by the surrounding schools and institutions, which refer people there. In contrast, most of the CoLab’s targeted e-centres are relatively unknown, located in small, largely underdeveloped communities and have generally no structured skills training programmes. Given that the outreach activity in such areas would need to appeal specifically to those with very little ICT engagement, digital platforms may be less useful than other strategies. The few trainees who had attempted to raise public awareness before doing the training programme, did so by means of traditional methods, e.g. pamphlets, local community newsletters, or simply word of mouth:

...we only market in ‘Jan Publiek’ and not everybody read that kind of stuff.
(Trainee 9)

...pamphlets... It’s better to use something [like] pamphlets... (Trainee 4)

...what we normally use here is word of mouth and everyone comes to the centre [because] of word of mouth. (Trainee 6)

I don’t put pamphlets anywhere... the word of mouth, it’s very, very powerful. If you have the right trainer, the right product and the right people then you have a graduation and you put the photos in the papers, I receive a million calls. (Trainee 8)

Through these outreach activities, e-centres are able to promote the benefits of ICT use which are likely to be relevant to specific target groups and draw users who would not otherwise have been reached. More personal and active forms of outreach activity may also be more effective in changing negative attitudes to ICT which prevent many from coming to the centre. Given the relatively small impact of these methods, the assistance of larger initiatives (e.g. the DI programme of the WC CoLab) could significantly increase the effectiveness of these campaigns and attract considerably more users. A collaborative relationship between e-centres and existing

local community institutions would also be beneficial in referring new users to the centres.

4.4.2 Provide access

At present access to ICT in these marginalised communities is mainly through these local community e-centres. Given the enormity of the challenge to provide access to all, initiatives that are limited to skills development are unlikely to make a substantial contribution. The research report argues that making a greater contribution is largely, beyond the control of those running the centres; this is something which policy makers (and likely a range of stakeholders) need to address. However, the findings of the empirical research suggest that there are other ways of reducing the access barrier, which should be adopted in future initiatives of this sort. Firstly, while most of these e-centres did not charge for their services, there are some that do. Making the services free at all of them would make a significant contribution to increasing ICT access in marginalised communities. This programme already provides the centres with open source software, as these resources are scarce, and a host of offline material to overcome the problem of poor connectivity.

We say the content is online... but if you have Internet problems we also put it on a CD-ROM... We gave them some access to the basket of open source tools on the CD-ROM as well. So it's definitely about access... (Provider 2)

The trainees suggested (to the e-skills providers) that communities would benefit from extended operating hours at the e-centre during weekends. However, those involved in e-skills development programmes generally do not have the power to make this kind of decision.

4.4.3 Tailored and contextualised initiative

The literature discussed in 2.5.4 emphasises the need to tailor e-skills initiatives to suit the needs of the specific local community. This applies particularly to technology and infrastructure. Aware of the challenges in the marginalised WC communities, providers opted to use more traditional forms of technology (i.e. the CD-ROM) as an alternative in areas where Internet connectivity poses a problem. They also provided software and made open source material available, realising that resources are scarce. Another important consideration was language. The providers catered for the

diverse needs of the trainees by using a group of facilitators, who were each able to speak at least two of the three official provincial languages. This ensured that those experiencing difficulty could be adequately assisted in the language of their choice, avoiding learning difficulties as a result of miscommunication and lessening the chances of embarrassment. Where funds are limited, it may not always be possible to have a range of multilingual trainers, but the findings of this study show that it is highly desirable. In the case of this particular e-skills training programme, the diversity in learners included those with certain (visual) impairments. This illustrates the importance of selecting appropriate technological tools, strengthening the argument for a highly tailored initiative (as well as reinforcing the need for focused target groups):

Some of the tools aren't blind friendly, because of the open source side of it our screen readers and stuff don't work on it. I had my zoom text there and it was fine but when I tried to use the screen reader to actually read the information back, it didn't read the menus and you don't know what's going on, on the screen. (Trainee 2)

The providers recognised that it was essential for the trainees to be able to relate to the content in e-skills training. Therefore they adapted content developed in and intended for another country to make it relevant for South African citizens. Provider 1 reported: *"What we did was, looking at the community or the target audience that we offered the training to, we localised the context so we made it more specific to our SA context."* She elaborated on this by reporting:

You wanted things that people would relate to so when we were in the area we took pictures of the centres and community members. So when they came to the training... they could relate to it, it was pictures taken in their community. I think that sort of crossed the barrier and they could feel like the content they were using was relevant to them, so they didn't read about some European, they read about South Africa, South Africans and our specific history. (Provider 1)

The e-Skills providers feel that where possible, content should not only be relevant to a broadly South African context, but also address events or issues directly related to

a particular community. The e-centre employees were also requested to bring photographs of their local communities to the face-to-face training to use as their personal content. A provider explained the need for such specifically localised content:

It's more relevant if we actually ask them about their own communities because they know their own communities better than just saying what are the needs in SA because that's very broad. (Provider 1)

In the interviews, trainees commented that having relevant content had played an important role in completing the assignments and tasks assigned to them during training. One explained how the assignments were based on what she was already doing in the community, making it easier to perform the task. On the subject of discussion forums, another trainee reported experiencing no difficulty as the content was relevant to her daily life. She stated:

Is daaglikse goe so jy is bekend daarmee. [Translation: It's the things you do every day so you know them.] (Trainee 5)

However, the providers realise that finding content specific to a particular community or target group will not always be a simple matter. In the case of groups that are very diverse, generic content that relates to the province as a whole should be selected.

Let's say I had 36 of them in the group, and they were from various disciplines, I would take generic content and I would use the same set of tools... HIV/AIDS pandemic is a topic that relates now across all fields... We can use that content and weave it through a Digital Inclusion project. They would gain e-skills, they would use the content that is generic and pertains to all our lives in South Africa, and you would still be able to e-skill that group. (Provider 2)

Although these socio-economic, generic issues, which affect marginalised WC communities, are appropriate e-skills development content, one trainee who conducts training at her local e-centre, made an interesting point. In the bottom-up integrated course she designed, community members provide the content and she makes it clear that fresh, original ideas are required. She firmly believes that

inclusion of “*out of the box*” content such as the very unconventional example of “*mompani worms*” (Trainee 8), not only promotes creative and critical thinking, but prevents the possible boredom that could result from using what may be seen as overused or recycled material.

The WC CoLab e-skills suppliers are wary of just “*dumping content*” (Provider 2) without using it in a contextualised fashion. The importance of appropriate, relatable and hopefully meaningful content was emphasised by providers who acknowledged paying more attention to it after they had taught the pilot group. However, in their view, content should not be the main priority, but rather be interweaved into the objectives or what the providers wish citizens to gain from such a course.

...content is the last thing we focus on. So we focus on the objectives of the course and in this course I created a set of objectives for the e-centre managers; what this course would enable them to do. (Provider 2)

Both the literature that was reviewed and the empirical findings emphasise a need to tailor the approach used as closely as possible to the needs of the targeted group or community. This includes careful attention to the geographical, socio-economic (particularly in the case of marginalised groups), language and cultural considerations when choosing the technology, skills, and content, as well as modes of delivery. It is important to be aware that original and interesting material could promote critical and creative thinking and prevent boredom. Tailoring an e-skills programme could significantly enhance the success of an initiative.

4.4.4 Focused target groups

The literature that was reviewed in 2.5.3 recommends working with specific target groups as opposed to working with a diverse group of people and adopting a blanket approach. Although the e-skills providers contended that programmes do not necessarily need to be tailored to specific groups, one stressed the importance of providing an individual with skills appropriate and relevant to him/her at that particular point in his/her life. A trainee informed the researcher that people were increasingly approaching the e-centre and requesting to be taught very specific skills that they needed at that point:

...hiers baie aanvrae in onse sentrum. Ons doen mos nou net die 2003 basic en dan ICDL maar hiers baie groot aanvrae... mense vra direkte training.
[Translated: ...there are many requests in our centre. We only do basic Microsoft Word 2003 and then ICDL but there's a big demand ... people are asking for specific training.] (Trainee 5)

Trainee 8 explained that it was important to consider the target group and their specific needs when deciding on what to teach and how to do so. Children get taught “educational programmes”, while:

...the elderly can be quite difficult especially in a new environment. They don't know what a computer is so first of all you need to have games you understand in order for them to move around with a mouse. (Trainee 8)

There is a specific market who need specific programs... I will need presentations, I will need excel but others, for heaven sake, they will never need presentations anywhere in the world or a database, they will never need that. (Trainee 8)

From this perspective, a blanket approach in which a set e-skills curriculum is taught to all-comers is not appropriate. It would be better to consider what people required in their lives at that time and what would help them. A provider refers to it as “just in time” training, explaining:

...the training must be [done] in such a way that it makes sense to me where I am now... ‘Just in time’ training... It must be bite size and you select what you require at that particular time. I think the understanding now is to go in and deliver, you know, this course... That's not the way anymore. (Provider 3)

This is clearly the strategy, which was adopted in this particular WC initiative by targeting groups with the same profession and delivering e-skills related to what is believed would be specifically useful to them. Judging from trainee responses, the strategy proved successful, considering they all noted that what they were taught directly applies to them in their professional capacities: “...the things they show you there is things you can use in an e-centre.” (Trainee 2) Although providers believe in approaches catering to the needs of rather specifically defined individuals, they do

not believe that e-skills programmes should necessarily be limited to an exact group. Instead, they feel that they should be able to cater for a diverse assortment of people.

It would be easy for us when we get a group that thinks alike but we should never box ourselves to adapt our programmes to only one group...I don't think we should close ourselves and box ourselves to a specific group... We should be able to include them digitally. (Provider 2)

According to the providers, e-skills programmes should be applicable to any group, across disciplines, "...but then you can make it specific to their subject matter" (Provider 2). Content and tools should vary according to the needs of specific groups and what would be relevant to them, as explained by a provider:

We had content that we tweaked for them and it was about the fundamentals of an e-centre manager... a group of nurses could come and the Digital Inclusion programme could be adapted for them, using content, weaving it with e-tools, so you giving them relevant content and tools. A group of pre-school teachers can come and we can create a Digital Inclusion programme for them, a group of doctors can come... Digital Inclusion is stretching across disciplines, so your programme should be adaptable, so that you can relate to that subject matter, that expert in the field, relevant e-tools, weave them altogether with the appropriate assessment and monitoring... That for me is again where we thought of education and not the technology. (Provider 2)

A final example from the empirical findings in support of targeting specific groups was the inclusion of a single visually impaired individual without sufficiently catering for him. This trainee stated:

Some of the tools aren't blind friendly, because of the open source side of it our screen readers and stuff don't work on it. I had my zoom text there and it was fine but when I tried to use the screen reader to actually read the information back, it didn't read the menus and you don't know what's going on, on the screen. (Trainee 2)

Given that this individual's sight was sufficient to allow him to take part in the training programme without significant difficulty, this was not an issue. However, it does strengthen the need for focused target groups, where a common factor would be specifically addressed in the programme design.

The essence of this approach is to be found in the words of a provider who stated that *"first and foremost you must know who your target audience is"* (Provider 2). The supply side has reported that e-skilling for DI initiatives should be able to train an array of diverse people. However, there are firm indications that the WC CoLab stance is aligned with the reviewed literature. The CoLab is currently targeting a specific group. It also makes continuous reference to directing the training at a particular discipline and adapting the programme (content and tools) to suit the needs of the particular discipline. Furthermore the provider's belief in "just in time" training as opposed to what she sees an outdated 'blanket approach' clearly corresponds with the literature recommendation. The combination of literature and empirical findings therefore strongly suggest that e-skills initiatives in the WC should adopt an approach in which training is directed at target groups and caters for the specific needs of those individuals at a particular point in time.

4.4.5 Avoid skills-based separation

Interviews with both supply and demand respondents confirmed the complexity of trying to separate trainees into skill-level groups. Discussions with these individuals, revealed the unreliability of self-rating:

We find that some of them actually rated themselves high in the learner profiles. They said they had basic computer skills and we found that on the ground, my facilitators had to be latched on to some people because some of those basic skills were not there, even though they had rated themselves as having basic skills. (Provider 2)

We did the questionnaire but... there's Google [laughs]. So it's not a true reflection of the person's knowledge in that sense because if there was anything on there... I did it, there was one abbreviation, I didn't know what it was and I just went on Google. (Trainee 2)

Ironically, this 'cheating' may be a positive factor. It indicates the trainee possesses the very skills, which the programme wishes to instil: "...it just shows initiative and that you already know where to get information" (Trainee 2). This individual is one of those who may not be acquainted with the specific tools in the training curriculum, but who enter the programme with generally higher levels of knowledge and experience of ICT than others, making them likely to learn faster.

Although he maybe didn't know the tools and he did learn quite a lot, I would say his knowledge [was higher] and he grasped the information quicker than most and he was very eager to participate. (Provider 1)

Difficulties related to having individuals across the skills spectrum in one group were also reflected in the empirical research. Along with it being "very challenging for the facilitators to work with a group that is so diverse" (Provider 3), both supply and demand ends revealed that the more knowledgeable and outspoken learners intimidated the others.

That was 1 of the trainees that actually intimidated the rest of the group because he knew so much and he was very vocal about it... We had to also try and curb that sort of personality because it made other people not want to interact... because they comparing themselves to that particular trainee. (Provider 1)

However, even though the intimidation was acknowledged, there was an overwhelming consensus amongst trainees that separation on the basis of skill levels should not occur. The less skilled trainees appeared to have benefitted greatly from being in the company of the others and could gain information and assistance, in addition to just being aided by trainers.

Daars baie van hulle wat meer skills gehad het maar hulle het dit gedeel met ons. [Translation: There were many of them who had more skills but they shared [their knowledge] with us.] (Trainee 5)

It was fine because say for instance if the trainers were busy somewhere else you could have asked your friend next to you or someone else. (Trainee 6)

In addition to the assistance, it was particularly the insight and perspective gained from someone considered more knowledgeable that made the experience truly valuable for some trainees. When asked for his view on the issue of being separated into groups based on skill, one individual commented based on his experience of another:

...then we wouldn't have seen his perspective or where he comes from even though he was way more advanced and experienced than a lot of us. (Trainee 1)

The enthusiasm with which this individual spoke of the “*more advanced*” trainee and what he had personally gained from him, illustrates the value of the non-technical knowledge exchanged through combining different people. Certain trainees also felt more comfortable accepting help from these more knowledgeable individuals than from the actual trainers, as they felt it easier to relate to their peers. This could be viewed as something of a problem for the trainees who were being called on to help.

...because of the diversity of the different e-centres, as we realised right from the start, it sometimes feels like a brain drain as well because everyone's asking you questions. (Trainee 2)

One guy is computer literate and the other just says he is and the one guy ends up helping the other one and doesn't get time to do his own work. (Trainee 2)

Nevertheless, even this individual is against being separated into skill levels and did not mind assisting others. The facilitation and assistance by the more knowledgeable or experienced is exactly what providers hope will happen when there is a wide range of skill levels in a group. It becomes a positive, instead of an obstacle to training. In this way, the providers are able to work towards creating a culture in which citizens share information and assist each other, considered very important in a knowledge-based society.

We ask them [the more skilled] to assist the people struggling so you also create that community of practice where they assist each other and help. (Provider 1)

One provider aptly addressed the issue of combining mixed skills, by removing e-skills from the equation and considering it an issue of teaching, where educators have to appropriately handle and educate very diverse learners.

This is a teaching problem. Even if you going to go into education one day, you are never going to be able [to separate according to skill], there's 40 learners in front of you, everybody has a different learning style. (Provider 2)

In short, the empirical findings indicate that dividing citizens according to skill levels or prior knowledge is an intricate task and should be avoided in e-skilling initiatives in the WC. Giving trainees an opportunity to gain from the perspectives and insight of more skilled and knowledgeable individuals has proved more valuable to some people than the acquisition of actual e-skills. The assistance and exchange of information which occurs by adopting this kind of mixed skills approach also help to build a culture of sharing information in which individuals work together, accumulate knowledge and uplift one another. However, providers should take care not to place so much pressure on more advanced trainees to adopt the role of facilitators, that they reach the point of experiencing “*brain drain*”, as one trainee put it, or find that their own work suffers.

On the issue of difficulties experienced by less skilled trainees as a result of mixed skill groups, one trainee noted the success of “*after-care classes*” (Trainee 8) in that specific community, where one-on-one attention or assistance is provided to those who need it. Finally, the providers believe that a properly designed course with appropriate e-tools will allow for the simultaneous training of diversely skilled citizens. While everyone will produce a product, the e-tools made available will allow the more skilled to deliver a more advanced result.

...if you were a fast learner, theirs were even more spruced up and the others were very basic... You will see sometimes, those [more advanced] people even say ‘no, no I haven’t finished mine’... So I think our selection of our e-tools was good. (Provider 2)

The empirical research accorded the view expressed in the literature (see 2.5.3) that separation based on skill levels is a very intricate process and is not advised in the WC. Furthermore, empirical findings indicate that the disadvantages in combining

these diversely skilled individuals can be controlled, and that they do not outweigh the potential benefits.

4.4.6 Demonstrate quality ICT use through parallel learning

Interviews with e-skills providers and examination of the training programme schedule and curriculum demonstrated that it is designed in such a way that trainees are learning basic computer skills while simultaneously learning skills relevant to their own personal or professional lives. Accordingly, basic operational skills like cut and paste functions, typing, or even Internet search skills were never directly focused on as a learning objective but rather developed through the process of learning other tools and more meaningful ICT engagement, developing products and ultimately skills, which would be beneficial to them. This is evident in the documented training programme provided in Appendix D. Providers explained:

We tried to do some things where you could actually implement your e-skills already so you not coming to type, you'll learn that by doing. So we didn't focus on today you going to type a paragraph and you typing and that's what you give back. We wanted them to see actual products so when they leave it's an actual skill or product they developed and they can actually see the value... What are you going to offer your community to go beyond just doing Word, Excel etc.? So this was including the people digitally and looking at other products. (Provider 1)

Our course was not to be sitting with Word and Excel and teaching people to copy and paste, because that was going to happen parallel; I do think the programme allows in the face-to-face week for the parallel learning. When we did the information resource bank, they actually then had to, they were taught some Internet search skills again, so even if you pretended you knew, you could get some Internet search skills there. You had to copy and paste into a table, so can you see how parallel [to that] Word and Excel was still happening. (Provider 2)

Training initiatives have the potential to convey different ways of interacting with ICT, which actually increase the quality of use at the same time as enabling users to obtain optimal benefits. In demonstrating avenues of meaningful technological use,

the CoLab, as well as two of the study's targeted e-centres managed to teach skills while maximising the quality of ICT use of new users and advancing the context of use of those who already possessed a certain degree of skills. Such a strategy is not only important in keeping e-skills training relevant, but also ensures that trainees are not bored or lose interest in learning and so leave the programme without knowing meaningful uses of technology.

4.4.7 Face-to-face, Online and Blended learning

The reviewed literature (see 2.5.1) explored the characteristics and suitability of face-to-face, online and blended learning approaches, within the context of e-skills development. The interviews with providers revealed that at this point many members of WC society are not ready for a purely online e-skills learning approach; they still require a face-to-face learning component. This finding accords with the literature. In addition to assisting with learning, the e-skills providers consider this face-to-face phase imperative to attract the attention and interest of those who are disinterested in technology. This is related to attitude as a barrier to DI. The need to overcome this barrier is yet another reason why face-to-face sessions are necessary. E-skills providers stated:

I think for our communities and for our people, they are not ready for just purely online, they need to be familiarised... I think our programme should always make sure that [during] that face-to-face week, we really grab them, so that they can work within an online phase. (Provider 2)

We know we [are] not ready for that kind of [purely online] interaction or even with the infrastructure you can't just put stuff online. People can't connect, how will they complete the course? So the human touch and human interaction is very, very important. (Provider 1)

This latter remark from a provider contains two significant points. Firstly, poor infrastructure in the WC prevents the online approach from being the central means of delivering e-skills in the province. Interviewed trainees confirmed this with more than half reporting difficulty during the online phase because of poor Internet connectivity. As one explained: "*The online didn't work that well. I think it's probably cause of our bandwidth and Internet problems*" (Trainee 1). Others described how

certain online course activities were cancelled because of these infrastructure challenges, while a provider stressed: "...*connection, connection, connection was an issue*" (Provider 1). Most of the e-centres in the sample consist of one small room containing a few computers, yet they serve as the only source of connectivity for not only a large number of local, but also neighbouring community members. This is further evidence of the hindrances to a strictly online approach. The e-skills providers have attempted to minimise this problem by providing additional offline mediums as an alternative to complete dependence on Internet connectivity. However, the self-learning approach as the central medium is still strongly discouraged in the WC.

Secondly, interviews with supply and demand respondents revealed that there was a strong emphasis on the importance of social interaction in face-to-face learning. One provider stated: "*You know what happens in that week, it's trust, relationships, it's tools, it's friendships, it's networking*" (Provider 2). This was evident in the interviews with e-centre employees. All but one of whom preferred face-to-face to online learning. It seemed that they enjoyed the social interaction: "*It's nicer when you [have] a lot of people*" (Trainee 1) and the sense of comfort in knowing that they "*are not alone*" (Trainee 4). This was a drastic change of opinion from the pre-assessment information (collected by the CoLab and reported in the released research document), where 99% of e-centre employees felt that the face-to-face training session was unnecessary.

In addition to the extra assistance, provided by peers (see 4.4.5), the empirical research confirmed that the social interaction between trainees is a particularly valuable way for people to learn from one another, even beyond the e-skills context. The remarks of two trainees, who were learners at the WC CoLab as well as trainers in their own respective communities:

If they don't ask questions and speak to each other, interact... I think that's more where they can get out of their shell, start thinking, understanding things better because me standing in front and just going through a lecture is not always the best way to teach or rather the best way for them to learn. (Trainee 2)

You also come to learn what other people do and how they behave and how they conduct their training... [It] tells why your centres fail and others thrive because you could watch other people. (Trainee 8)

The insight and knowledge obtained from interacting with others proved very beneficial for many e-centre employees, evident in the comment: “[The] *thing is if you listened to him, you could’ve gotten a world of information from him.*” (Trainee 10) The high regard in which one trainee held another came across clearly as he described their interaction:

I remember on the first day we spoke about what is day and then he asks ‘what is night?’ Now he gives this long explanation about what is night so he says it’s the absence of light, darkness is the absence of light, it’s not really dark. (Trainee 1)

This philosophical discussion left a profound impression on this trainee who is clearly still impressed by the new perspectives he was exposed to during his face-to-face interaction with certain individuals, even a year after training. Another observed that face-to-face learning is also beneficial for those individuals who enter training with ‘know it all’ attitudes. Because of the nature of the environment which encourages some sort of social interaction, these individuals often end up learning from others as well and vice versa: “[He] *learned that not only he knew quite a lot, he came to realise that others knew quite a lot [too]*” (Trainee 8).

Other e-centre employees reported that these face-to-face aspects of gaining different perspectives and acquiring knowledge were particularly missed during the online phase. Online learning does not, however, mean that social interaction is necessarily eliminated. In this case, it seems to have had the opposite effect for some. One trainee explains how social interaction in the online sphere was a distraction from completing the assigned work:

The only thing that was kind of frustrating was we now met here and some friendship formed, now we online on Google Chat and we had to answer something then the whole conversation was like ‘Hoe gaan dit met jou?’ [Translation: How are you?] ...and that was frustrating to me because I just

wanted to do my thing now I have to listen to this story and that, so that's the only thing that wasn't cool for me in the online [phase]. (Trainee 3)

This extract is also testimony to the “*relationships... friendships... [and] networking*” previously referred to by Provider 2. Interviews confirmed that face-to-face interaction amongst e-centre employees built up a network. Most of these employees reported that they had remained in touch with one another post-training, through social media. Developing these networks is in line with the WC CoLab’s e-skilling for DI agenda to promote communication and connections between citizens, as a basis for information and knowledge sharing. This networking and communication is considered imperative in addressing the socio-economic issues affecting these communities, as a provider explains:

“...they come from various areas [but] they have the same challenges... Now you start hearing ‘Ja ons het die selfde probleme’ [Translation: Yes, we have the same problems], so definitely the network, face-to-face [is important].” (Provider 2)

The observed resistance to knowledge sharing and collaboration in these communities (discussed in 4.3.6), increases the need for face-to-face sessions as literature (Romani, 2009a) prescribed this type of training approach as the means to develop these abilities and promote networking. Face-to-face learning was also preferred for its convenience, immediate assistance and clarity in communication, as some trainees reported:

The face-to-face part, I think I prefer that because we could easily interact... Ok you could online as well because I could send them an email [saying that] I'm struggling here, but it's better in person, you have a lekker [good] understanding. Now it's on email and it doesn't have the same effect. (Trainee 3)

Face-to-face, you could have learned a lot because where you don't understand you could ask questions and that was the easy part. When we were at home and had to do it online, I had to call or send an email every time I don't understand something but face-to-face I get an answer immediately or someone else in the group could have helped me with that. (Trainee 6)

Another strong reason for the incorporation of the face-to-face phase, according to the data gleaned from interviews with e-skills providers, was preparation for the online phase. While one trainee admitted that he had forgotten things in the period leading up to online learning, the rest felt sufficiently prepared by the face-to-face phase. Trainee 3 expressed this by stating: “Whenever I had a hiccup then someone was there so when I left, I knew this is how to do it.” A provider provided a more in-depth explanation describing face-to-face learning as:

...preparation for the online phase. They are introduced to the online platform, they know how to use it and they use it every day. So by the time they leave they know how to log in, they know what to look out for in terms of browsers that they might use in their e-centres. We allude them to those kind of issues they may experience, getting access to sites, going into the actual tools, the discussion forums [and] contributing. So they do that every day during face-to-face, so when they go home they know how to go into a discussion topic, reply to their messages and things like that. So the face-to-face is very, very important. It's key for them to complete their online phase. (Provider 1)

Only one trainee reported preferring online learning (after completion of the training programme). The reasons for this preference related to being able to perform tasks and complete assignments within one's own personal comfort zone, without the pressure of others around observing her work. This individual acknowledges that her objections to the face-to-face learning were largely related to her anxiety and nervousness caused by being surrounded by others, but admits that the social interaction ultimately assisted in her learning. An interesting observation made by another trainee was that the online phase didn't require enough of them in terms of the skills, which they had already developed during face-to-face training. As a result, a real sense of confidence in these skills was not established. Blended learning approaches should ensure that this is fully taken into account in the programme design.

E-skills providers raise another interesting point regarding online, self-learning. According to them, it requires an appropriate attitude, commitment and time management – more so than face-to-face. These providers are doubtful whether enough of the WC marginalised citizens are sufficiently equipped with these qualities

to be able to successfully learn through strictly online training sessions. In fact, lack of motivation and a positive attitude towards e-skills development was the reason for the providers' belief that face-to-face sessions are needed to familiarise and “grab them”. This again emphasises attitude as a possible barrier to e-skills development. A provider explains:

Where you do start seeing a difference [in people] is at the online phase, because there you need attitude, you need commitment and you need to manage your time. So I find in the face-to-face [they are] all ready to go, motivated, some of them are even the talkative ones, and I think commitment, dedication and attitude [is] still a very important thing in life. (Provider 2)

Face-to-face learning may therefore be required in the WC but it did not prove to be without flaws. Connection and technical difficulties were reported during this phase as well, although this was only described by trainees from the pilot cohort, indicating that these problems may have since been corrected. Some trainees also specifically stated that the face-to-face sessions were too short for the amount of work covered. Given the geographical scope of the WC and the number of citizens who require training and whom the programme eventually aims to reach, it would not be feasible to extend the length of the face-to-face sessions. The empirical findings, like the literature, recommend the adoption of a blended learning approach to e-skills training in the WC.

According to e-skills providers, a blended approach refers not only to the integration of online and face-to-face learning, but also contains blended strategies, e.g. group work, presentations and individual accountability. One e-skills provider explains:

...blended approach doesn't mean... [that] you only referring to online and face-to-face. Even within your face-to-face week, you have blended approaches. So you would see, there was talking, presentation is very important, there were flipcharts and then you have to make sure there's individual accountability...each one was expected to complete a product and upload it and then the group work definitely. You select one that's going to be the scribe, you select one that's going to be the presenter... but as a facilitator you should see that your programme shows individual accountability. Otherwise you're going to have X maybe in a

group that's doing nothing. Y is doing all the presentations and she's uploading it. You know that's happening as well. So you rather have individual accountability, where each one must produce, so that means each one must show which skills they've attained. So for me blended is also about the blended approaches you putting in that face-to-face week. (Provider 2)

While many e-centre employees reported enjoying group work, some expressed a preference for working on their own. One trainee, for instance, stated that she would rather “*sukkel alleen*” [Translation: struggle alone] (Trainee 5). Providers, however, believe group work is imperative for going beyond the scope of mere learning to preparation for other environments such as the working world. One explained:

They [trainees] prefer individual [work] but we allowed them to work in groups as well because that's the nature of the game. I think also within your work environment you can't just work individually, you have to work in a team as well so we try to get that across. (Provider 1)

Overall, group work appears to have been successful in the e-skills training in the WC. Even the trainees who preferred to work alone acknowledged that group work was useful for learning. As one reported, “*...interacting, doing group work things like that... you learn much more that way. As was the case for me on the training when we broke up in little groups.*” (Trainee 2) The pre-assessments of the trainees (as reported in the CoLab documents) strengthen these findings, revealing that while 95% of the e-centre employees initially preferred working alone, they were very active and engaged in group tasks.

Interviews also revealed that some trainees found group work intimidating. A trainee stated: “*At first it was intimidating because we didn't know the people. They came from other places*” (Trainee 3). Another confirmed the role of intimidation by stating that this had not been a factor only due to the fact that they “*didn't have the dominant people*” (Trainee 8), in their group. Advantages of group work, revealed through the interviews, include minimising problems presented by low basic literacy rates, making activities which some consider tedious more enjoyable and building transferable competences. It should therefore be incorporated in WC e-skilling or DI initiatives, along with the individual accountability component discussed by provider

2 above, believing that “*each one must show which skills they've attained.*” This combination of group and individual learning was also discussed and considered an important training strategy in the reviewed literature (Kluzer et al., 2011), reaffirming the need for such an integration of methods in the WC.

To sum up, the empirical findings and the literature suggest that the WC requires a blended learning approach to e-skilling for DI, with face-to-face and online phases. Interviews with providers have also showed that blended learning implies blended strategies even within these phases: methods such as group work and individual accountability should be appropriately incorporated.

4.4.8 Formal, informal and innovative approaches

The CoLab e-skills training is a formal, structured initiative. However, the overall strategy is based on the awareness that informal methods are needed to achieve the desired objectives in WC communities. The initiation of these strategies into communities was worked into the programme curriculum through the assignment of specific course tasks. These required the trainees to actively recruit volunteers from the community to help at the centres. According to the research report, most local citizens responded positively and indicated that they would be willing to work without pay because it would give them a valuable opportunity to acquire skills and experience: “This would capacitate them to become change agents in their communities.” (Stoltenkamp et al., 2013, p. 3487). There were other volunteers in the form of school children who requested permission to work as volunteers at the centres over the weekends in hopes of developing e-skills and increasing their employment prospects.

While formal avenues remain important, the extent of digital exclusion in the WC calls for additional methods. Recruiting volunteers and other innovative means of involving local community members in inclusion efforts should be used in addition to more formal approaches.

4.4.9 Learner-centred approach

4.4.9.1 Address expectations and keep learners informed

As can be seen from the training schedule (see Appendix D), the very first activity (after establishing ground rules) was to gain an accurate sense of the expectations

of each learner. The CoLab research report includes the following expectations: to hear other trainees' opinions; to be empowered by learning new ideas and be able to utilise the acquired skills/e-skills so as to improve their e-centre services; to acquire specific e-skills so they could make effective use of computers; to be able to plough back the skills they had learned at e-centres or in community into efficient management; to have a strong team leader so as to be able to support and encourage the team; and to learn more technical computer skills (such as troubleshooting) (Stoltenkamp et al., 2013).

According to empirical findings, facilitators should keep trainees updated on what lies ahead in the programme. One trainee mentioned how being informed in this way is necessary to allow every individual the time needed for potentially nerve-wracking tasks that lay ahead, which many found the presentations to be. Providers tended to agree with this and explained:

...when they came the first day we had an introduction and it was explained to them what they were going to achieve and as we went along they were always informed of what we going to do [and] why we doing it. (Provider 1)

In addition to making sure they had the programme of upcoming tasks and activities, the data shows that it would be useful for them to be given the reading material to be used ahead of training. A trainee specifically noted this during an interview stating:

I would've preferred to have all that material we had to read through in the mornings and the afternoons, to have that beforehand, before we went there, actually before the training started, to be more prepared... be prepared with questions, knowing what to expect, know what to ask, things like that. (Trainee 2)

Keeping trainees informed and allowing them time to prepare may help to make the training more productive and valuable. Slower learners may find this especially beneficial.

Having a good sense of learner expectations may be particularly useful in deciding which areas need more time or attention than the programme has assigned to them.

4.4.9.2 Safe space

The literature suggests that e-skills providers need to put trainees at ease by reducing fear and apprehension and being empathetic to their needs (Institute for Innovation in Learning, 2010). Empirical findings reveal that the WC CoLab e-skills providers have similar beliefs and feel that they *“did a good job in trying to create a safe space for them”* (Provider 1). Their success in doing so is reflected in the trainees’ comments that the friendly, welcoming approach of the facilitators helped to make them feel at ease, which allowed them to have a more productive learning experience. Nevertheless, many of these trainees reported feeling very shy, nervous and intimidated during training sessions. This highlights the importance of making a concerted effort to create a safe space for trainees throughout the training.

Creating an atmosphere where trainees feel relaxed and comfortable assists in creating a safe environment. With the exception of one trainee who described some trainers as *“very very serious”*, all of the trainees perceived the learning environment as inviting: *“very much sociable”, “laidback”, “easy-going”* and *“relaxed”*. Each one of them expressed a clear preference for this, with some commenting on how this relaxed setting encourages information sharing and learning. One trainee explicitly referred to the intimacy of the training environment:

...we like a family they said, so we have to talk to each other and to learn... It was like you are sitting with your friends. Seemed like you back in high school; it was your class; teacher knows you knows how to handle you knows like ok maybe you a bit slow. (Trainee 7)

Providers also confirmed the importance of creating this atmosphere in order to build trust and enhance the process of learning.

“I think that’s a plus for us like I say you build trust relationships... they feel relaxed and you become [what] I call an e-skills family, which is very important. I want to attain that by the end of the first day... You want that atmosphere because you know that also helps them to be creative.” (Provider 2)

Providers also reported that the personalities of trainees play a determining role in the atmosphere of the training environment - one cohort may be more vocal and

lively than the next. These providers believe that it is the duty of the trainers to create a balance where the learning environment is comfortable and relaxed, while still maintaining some sense of structure. The discussion of ground rules at the very beginning of the programme is an important means of establishing the proposed structure. A provider explained this necessary balance:

I would say it's a combination, not really stiff formal... you can see the group you speaking to so we try and accommodate, but we not the formal lecture... It's interactive; they can answer any time or ask a question, we don't have that where people feel they can't [speak]... I think sometimes we have a little bit too much of being comfortable and allowing them that they try and sometimes take over. I know with the last group they were very talkative so they wanted to debate a lot more so you had to actually, curb them but they were very interactive, they were speaking, whereas the first pilot they didn't speak so much they were very quiet... so it also comes back to personalities, the characters you have. (Provider 1)

WC DI initiatives should therefore create a safe space for trainees through the use of friendly facilitators. This could reduce fear and apprehension, build trust, and create a relaxed, sociable atmosphere, which encourages interaction. At the same time it would make it possible to retain the structure of the training session and keep control of the group. This illustrates the complexity of selecting appropriate trainers for e-skills training initiatives.

4.4.9.3 Appropriate learning pace and time allocation

As with the reviewed literature in 2.5.6, reports from the e-skills providers recommend keeping to a slow learning pace to accommodate all attention spans. This is illustrated in the following sample statements:

We basically designed [the programme] so that we could accommodate the slowest learner, so we took it very slow and there were a lot of us [trainers]. (Provider 1)

Let people learn at their own pace. (Trainee 8)

The providers were not always successful in choosing the appropriate learning pace. This emerged in the interviews with trainees, many of whom complained that they were unable to keep up during training.

Sometimes the training [was] so fast! [They] must slow down. (Trainee 4)

To consume everything, it was too fast. Or for the time allowed to consume everything, it was too fast. (Trainee 1)

Another trainee reported not having learned a lot from the course as a result of the rapid pace of learning. It should also be noted that these reports stem from trainees across the skills spectrum, not only the less skilled, uneducated or slower learners. Some found that they could not catch up, and they experienced a disruption of their learning. Others had no problem with the pace of learning. One trainee however, felt that it was too slow and admitted to being a bit “bored”, although patient and understanding. These accounts illustrate the diversity in trainees and the difficulty in setting a pace in such an initiative.

The empirical research suggests that the time allocated to tasks is vital. Facilitators should ensure that each section of work is sufficiently understood before moving on, reducing the possibility of the trainees becoming confused. A trainee referred to a previous computer course to make the point that a lack of time to digest material diminished the value of the course as a whole.

Create time for that specific programme. Make sure she/he understands before she/he applies... I think 80% of us felt the course was actually too much information, which they couldn't grasp within that very short time.
(Trainee 8)

Deciding how to allocate the time is a complex matter. The e-skills providers (based on information obtained from the examined research reports) tried to take full account of trainees' personally reported schedules and available time when deciding on assessment and submission dates. Even so, it seems that more account needs to be taken of the different learning paces at which people work. Despite the care taken to accommodate all learners, a significant number of trainees still reported that they experienced a degree of confusion. Training should therefore occur at a pace slow

enough to give all learners sufficient time to attain each learning objective. Careful monitoring should be done before moving on.

4.4.9.4 Group size

The literature (see 2.5.6) recommends using small groups in e-skills training. Although both providers and trainees share this view, their definition of 'small' differs somewhat. Trainees mentioned figures of about ten people, while providers consider "up to 30" (Provider 1) a manageable number. In the case of a larger project such as the WC CoLab where more staff are available, 'small' may be interpreted differently from a project at a community e-centre with only one or two employees to deliver training. Another factor, observed by one of the trainees, is that each individual requires his/her own computer during training. The trainees' level of literacy is a strong reason for an insistence on smaller groups. Those who have low basic literacy levels require a greater amount of assistance and attention from the facilitators. A provider reported:

I think up to 30, that's the cut off. After that it becomes a bit problematic to deal with them especially with the literacy rates they come with, it becomes a problem because you might not have enough people to deal with them.
(Provider 1)

The literature review and the empirical findings concur that it is important to work with smaller groups of trainees. This seems of particular importance in the WC where trainees whose literacy levels are low need close attention.

4.4.10 Manage poor levels of education

The report indicates that the trainees in this particular programme had fair to good reading and writing skills so low levels of education was not a significant problem. Interviews revealed that group work was a way of assisting those who were having slight difficulties in understanding the work because of literacy barriers. Instead of viewing literacy as a barrier to the development of ICT skills, some choose to concentrate on the opportunities ICT training presented. They felt that these initiatives should be more widely recognised and used as a way of increasing literacy, language and numeracy skills (Bradbrook & Fisher, 2004). One trainee recognised this opportunity which training presents and made English a specific

focus in her local (predominantly non-English first language community) e-skills training. She explained that this was an intentional strategy aimed at improving the level of the centre users' basic English literacy while they were learning e-skills. These users were encouraged to use a thesaurus and spell checker. A partnership between those involved in e-skills initiatives and educational institutions (see 4.4.1) could increase the capacity of target groups to perform in training environments. Poor education often indicates poor vocabulary and providers should make every effort to keep the language they use at a basic level where every trainee is able to understand. A trainee observed:

...nou kom jy daar nou praat hulle van die hoë woorde en jy weet niks nie.”
[Translated: “...now you come there then they use these big/difficult words and you haven't a clue.] (Trainee 5)

Based on literature, it seems that where literacy presents itself as a problem in the acquisition of digital skills, courses have successfully made use of symbols, audio and online tutors (Junge & Hadjivassiliou, 2007). Video and audio-based content is particularly useful and websites promoting these formats should be recommended (Media Alliance, 2007).

4.4.11 Multi-stakeholder approach

This WC e-skills initiative involved a range of interested and invested parties, ranging from government, to business, to academia, to local community members and organisations. Interviews revealed that the e-skills project was very top-down driven at that stage. Although certain e-centre sites were visited prior to the commencement of training to do briefing sessions and get a sense of the communities, only a few of the interviewed trainees' centres had been visited. Nearly half of the trainees in the sample felt that they should have had more input pre-training and that their questions should have been adequately addressed. Even so, there was a general consensus amongst trainees that the programme sufficiently addressed the needs of their communities. Only one e-centre employee refused to answer this particular question.

Although the trainees did not feel that they had been sufficiently included (and therefore were equal stakeholders), the providers eagerly confirmed the literature perspective that e-skills initiatives should be an integration of top-down and bottom-

up strategies: “...it must be driven from a needs perspective and not just necessarily from a provider perspective” (Provider 3). In addition to conducting a pre-training needs assessment, they made each trainee an active member in this process assigning the task of extracting information from each respective community on the specific local needs. This is reflected in the CoLab report in describing the programme’s focus on “...local communities becoming active trainees, rather than passive recipients of services” (Stoltenkamp et al., 2013, p. 3487). The providers intend to make more use of a needs perspective in the future: “where we want to move now is to say ‘what are your needs and how are we going to help you in doing that?’” (Provider 3)

There was one particular complaint that was frequently and freely made by e-centre employees during the interviews, without any prompting from the researcher. Although e-centre employees had been sent to the WC CoLab for e-skills training by their superiors, many of them were prevented from implementing what they had learned in their respective centres. This illustrates both a lack of support of the trainees and a gap in the communication between stakeholders. Trainees reported:

...we were supposed to [train people], we would’ve done it but with regards to [administration] and management... It’s weak it’s weak, there’s no support from them. (Trainee 1)

...we can’t start with training or anything else.... We’ve been waiting for a while now, it’s been two months. But we [are] also waiting for the MOU from the municipality to get the next room [for training]. (Trainee 5)

We’ve got [a] multi-stakeholders approach here, that’s how I call it... everybody’s involved... [but] politics plays a big role. (Trainee 8)

The CoLab research document acknowledged the “political interference” referred to here (Stoltenkamp et al., 2013, p. 3491). It also described miscommunication between stakeholders during the face-to-face period, leading to potential disruptions in training. Gaps in communication between stakeholders were personally observed by the researcher during a face-to-face training session. Certain project stakeholders, (not directly related to the practical training process) came to the site

during most of the week to observe the training sessions. Trainees and trainers alike appeared very aware of their presence, mainly because of their frequent tendency to wander around the room, often hovering behind and watching trainees perform tasks. This form of active observation and somewhat superior (likely intimidating) presence seemed to detract from the comfortable and relaxed atmosphere, which the trainers had attempted to establish. A provider reported that “...it was a little bit overwhelming... a bit uncomfortable...” and that “...they should just tone it down a bit, just observe” (Provider 1). Along with this apparent difference in opinion regarding the training process, there was evident miscommunication between stakeholders. No agreement had been reached on arrangements prior to training: “...we weren’t aware of it... the actual day it started we were informed that these people would be sitting in on the training.” (Provider 1)

The recommended role of multi-stakeholders in the findings of both the literature (see 2.5.5) and the empirical research may be summed in an extract from the CoLab report stating that “Stakeholders need to be involved at all levels, so as to understand the objectives of the Programme” (Stoltenkamp et al., 2013, p. 3491). It is vital to have a multi-stakeholder approach, making sure that parties with vested interests are fully aware of the objectives and strategies involved in the programme, as well as their specific roles (and boundaries) in attaining the defined goals. This entails a high degree of clarity, understanding and communication between the various stakeholders. The research also encourages an integrated bottom-up and top-down strategy, where the targeted group or community is viewed and treated as an equally important stakeholder and actively involved from design to implementation.

4.4.12 Summary of pertinent approach factors to e-skills delivery

The reviewed literature revealed certain key factors pertinent to e-skills delivery, some more complex than others. The empirical findings provided more clarity on the subject of e-skills delivery approaches within the WC. The significant findings are presented in Figure 17 below. This will be given further attention in the recommendations related to the final conceptual framework.

<p>e-Skills Delivery Approach Guidelines</p>	Raise public awareness
	Provide access
	Implement a tailored and contextualised programme
	Focus on specific target groups
	Avoid skills-based separation
	Demonstrate higher quality use of ICT
	Adopt a blended learning approach
	Integrate formal, informal and innovative approaches
	Manage poor levels of education
	Adopt a learner-centred approach
	Include multi-stakeholders

Figure 17: e-Skills delivery approach guidelines (Source: Author)

CHAPTER 5: PROPOSED CONCEPTUAL FRAMEWORK

5.1 Introduction

A framework for DI in marginalised WC communities was developed. This is based on the knowledge obtained by combining insights from the literature reviewed and the empirical findings from supply and demand ends of the WC e-skilling for DI initiative. This chapter presents this framework, describing each of its components.

5.1.1 Digital Inclusion

5.1.1.1 *Digital Inclusion Conceptualisation*

The concept of DI encompasses a range of narrow to broader intentions, which may be understood in terms of immediate outcomes and resulting impacts. Fundamentally, DI in the WC is concerned with providing access to information and increasing the degree of ICT usage, specifically in basic and personally relevant ways. It is intended that through these outcomes, behavioural patterns gradually change, which improve quality of life to some extent. This is particularly significant considering the pertinent and prevalent socio-economic issues affecting the province. Although a direct correlation may not be drawn, it is envisioned that these short-term outcomes and impacts eventually result in thorough domestication of technology leading to a far wider range of benefits across various facets of life. In addition, DI-related programmes hope for a progression from passive consumers of information to active creators of content and knowledge; as well as critical and strategic thinking as opposed to less than thoughtful technical practices. Ultimately, DI is concerned with increasing (social, economic, cultural, health, civic or political) participation of marginalised members of society and reducing social and economic inequality. It is closely aligned to the concept of social innovation within the province's marginalised communities – developing solutions for socio-economic challenges and using ICT in achieving them. In this sense, rather than a technological focus, DI is conceived as an issue of human capacity development and is intended to eventually impact education, employment and other provincial priority areas. It is envisioned that DI will ultimately result in the empowerment of marginalised citizens, the upliftment of underprivileged communities and the formation of an information and knowledge-based society.

5.1.1.2 Digitally Excluded Groups

The digitally excluded citizens in the WC are not restricted to but typically fall within one or often several of a few specific categories. For the most part these are the socially and economically excluded, which usually coincides with the historically disadvantaged members of society – generally ‘Black’ and ‘Coloured’, ‘Afrikaans’ and ‘isiXhosa’ speaking groups living in geographically remote and underdeveloped areas. Additionally, rural communities, the elderly and some special needs and disabled groups are at risk of digital exclusion.

5.1.1.3 Barriers

The central barriers preventing marginalised WC community members from using ICT and becoming digitally competent have been identified as lack of awareness, lack of access to ICT, poor levels of education, lack of appropriate e-skills, inefficient quality of technological use and negative or unsuitable attitudes towards the use of technology.

5.1.1.3.1 Awareness and knowledge

Awareness and knowledge of the importance and purpose of ICT, where to obtain access, the value of information and knowledge, and the potential benefits which may be derived from ICT are required for effective functioning in modern society. Lack of understanding of these areas is a barrier to DI in marginalised WC communities.

5.1.1.3.2 Access to ICT

Access is a central barrier to DI and the development of digital competence in marginalised WC communities, where poor infrastructure, basic ICT and Internet connectivity continue to be a challenge. This is largely a result of financial difficulty and lack of ICT access serves to reinforce and increase existing socio-economic inequality.

5.1.1.3.3 Education

Lack of or poor education is a significant challenge in the development of e-skills for a large portion of the excluded population. Those with poor reading, writing and general comprehension skills may be able to perform the technical skills in

interacting with ICT but generally struggling in the cognitive aspects, required for effective processing of information.

5.1.1.3.4 Skills

Appropriate skills are imperative in attaining the benefits associated with DI. These include a broad range of abilities from basic literacy, technical operational skills, cognitive and more general transferable skills. While all of the identified skills are not required for interacting with ICT and achieving certain practical benefits, the full range of DI outcomes and impacts are highly dependent on the development of these skills.

5.1.1.3.5 Quality and context of use

While basic uses of technology may deliver certain benefits, more innovative and meaningful use of ICT is required to obtain more substantial benefits from technology, which users with more advanced technological interaction may be gaining. While an individual may have access to ICT and the appropriate skills to make use of it, a limited range of usage will likely still prevent substantial life improvement and the maximum benefits of DI.

5.1.1.3.6 Attitudes

Fear of and a general disinterest in interacting with technology or acquiring digital competence has become a highly significant barrier to inclusion for many, particularly where access is readily available. Negative attitudes in relation to sharing knowledge with others and using technology and skills in appropriate ways to benefit personally or professionally, as well as a lack of confidence to contribute or create content are barriers to deriving greater potential value of ICT.

5.1.2 Digital Competence

The reviewed literature and empirical findings have identified skills required for digital inclusion, however what was discovered through the process of data analysis, was that these requirements consist of a combination of skills, knowledge and attitudes. For this reason and in an effort to provide more clarity, the conceptual model will refer to the 'digital competences' required for digital inclusion within marginalised WC communities, rather than the more elusive 'e-skills'. The skills, knowledge and attitudes are composed of the following elements:

5.1.2.1 Basic competences

This consists of basic reading, writing and numeracy skills and the willingness to use these in ICT environments. These abilities are generally expected to be developed during basic education and not ICT training, however they are necessary for the effective use of ICT and functioning in the information and knowledge-based society. These are also sometimes referred to as fundamental skills as they form the basis for the development of many other abilities, particularly information literacy.

5.1.2.2 Technological competences

5.1.2.2.1 Operational skills

These are the basic technical skills involved in the operation of ICT and are required to retrieve potential benefits, which may be derived from the use of technology. It consists of the ability to interact with hardware, software, networks and various communication devices, understanding the context and purpose of use of the medium. Higher levels of operational skills may indicate that the individual has a more firm grasp of other abilities such as navigation skills. More advanced operational skills may also increase the motivation to use these abilities to obtain personally or professionally meaningful benefits. Operational skills are necessary for the short-term outcomes of DI entailing simple basic use of ICT.

5.1.2.2.2 Navigation skills

This refers to knowledge and understanding of the structure of the Internet and the skills to make one's way through its non-linear arrangement. This is necessary in order to obtain the specific information sought after and to prevent the individual from becoming overwhelmed, frustrated or discouraged. These skills are particularly necessary where money and other resources are limited, and access to and time to do Internet searches are not readily available. Navigation skills may be more difficult for those with lower operational skills. These skills are urgently required for the short-term outcomes of DI to be achieved, given the major role of the Internet in ICT to access information.

5.1.2.2.3 Security skills

This entails an understanding of the privacy issues and risks involved in the use of technology, particularly related to the Internet. It includes the ability to apply security measures in digital (online and offline) environments to minimise risk, in order to

protect and maintain hardware and safeguard personal privacy. This requires a responsible attitude to all forms of digital engagement. As with the other components of technological competences, security skills are required in the short-term outcomes of DI as they play a vital role in allowing users to safely engage with technology.

5.1.2.3 Information literacy

This is based on an awareness of the value of information and where to retrieve it, as well as the skills to locate, select, organise, integrate, analyse, evaluate and apply information. These skills are required outside a digital context as well, but they are particularly relevant here given the increasingly electronic nature of modern society. Basic literacy is a prerequisite for being fully information literate. More advanced cognitive abilities are required to integrate, analyse and evaluate information, which requires a critical attitude towards information. Information literacy is important for the envisioned broader impacts, but it is specifically required for the short-term outcome of DI - enabling citizens to access and effectively use information.

5.1.2.4 Media literacy

Media literacy requires an understanding of the nature of the media in modern society, including how the media work and produce meaning, the different platforms in which they exist, and the merge that has taken place between traditional and 'new' media. This includes the ability to use and interact with a variety of traditional and modern media sources and platforms and to manage digital media formats (e.g. video, audio, text, graphics), to complete personally and professionally relevant tasks. A critical and creative attitude towards media is important. Basic modern ICT use is largely based on interaction with a range of digital media and therefore this competence area is directly related to short-term DI outcomes.

5.1.2.5 Communication and collaboration

Digital inclusion requires the skills to share and express information and knowledge virtually and face-to-face. This also entails interpersonal skills, including understanding and abiding by the socio-emotional 'rules' or etiquette in (off- or online) communication, the ability to work effectively in a team and a mind-set open to collaboration and sharing of information and knowledge, which is a central principle of the information and knowledge-based society.

5.1.2.6 Real-time thinking

This entails being aware of and processing various stimuli directed at one in virtual, interactive, multimedia environments. It requires the capacity to divide attention and internalise and interpret information which was received from a number of different stimuli. This cognitive functioning (analysing the situation) usually occurs almost instantaneously or in 'real time', followed by a reaction by the user. The response could be in the form of a single or multiple simultaneous tasks. Real-time thinking is not directly required for the short-term basic outcomes of DI. This ability may only come into play or be necessary when the individual advances to a point of wanting to interact with more modern, interactive and innovative forms of technology and to obtain a higher level of benefits.

5.1.2.7 Creation of content

This requires an awareness of the existence and value of user-generated content. Contributing content and potential knowledge to the digital environment requires the ability to organise, integrate, edit, adapt, design, invent, apply and present digital information. This requires the integration of elements of operational, information and media literacy, in addition to the editing, designing and inventing processes required for creation. Creation also involves a level of confidence in one's ability to produce and contribute (beyond only consuming) content on a digital platform. Users could be considered digitally included or competent when the extent of their ICT interaction is limited to consuming digital content, allowing only for the more simple goals and benefits among the discussed objectives of DI in **Error! Reference source not found..** Creation and contribution of content (and/or knowledge) may therefore be considered a somewhat advanced competence component, which makes it possible for the broader objectives of DI to be attained.

5.1.2.8 Transferable competences

These are the non-technical skills, the most significant being critical thinking (which includes the process of reflection), strategic thinking, problem-solving, sense-making and a desire to continuously learn. These are higher level skills used both in and out of the digital context and are particularly required for the long-term DI objectives such as empowerment, social innovation or making use of ICT in ways that will have meaningful personal or professional impact.

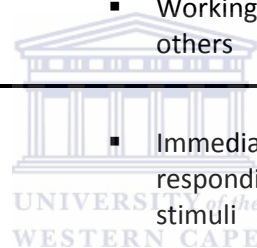
As discussed, certain competence areas directly relate to the intended short-term outcomes of DI, while others become more relevant in the long-term objectives. A detailed description of the knowledge, skills and attitudes of each of these digital competence areas is provided in Table 15.



Table 15: Digital competence areas (Source: Author)

Competence component	Digital Competence		
	Knowledge	Skills	Attitudes
Basic	<ul style="list-style-type: none"> Understanding of basic language, grammar and mathematical concepts 	<ul style="list-style-type: none"> Reading, writing and performing basic numerical functions 	<ul style="list-style-type: none"> Motivated to learn and use basic skills in ICT environments
Technological	<ul style="list-style-type: none"> Awareness of ICT and the context and limitations of use Awareness of potential benefits of using technology Awareness of security risks involved in using technology 	<ul style="list-style-type: none"> Operating hardware, software, networks and other ICT devices Navigating through the Internet to find specific information Applying security measures in digital environments to minimise risk 	<ul style="list-style-type: none"> Positive attitude towards using technology and motivated to receive the potential benefits Safe and responsible attitude towards ICT use
Information	<ul style="list-style-type: none"> Understanding of the value of information (as a means of acquiring knowledge) and where to retrieve it 	<ul style="list-style-type: none"> Locating, selecting, organising, integrating, analysing, evaluating and applying information 	<ul style="list-style-type: none"> Critical and reflective attitude towards the wealth of available information
Media	<ul style="list-style-type: none"> Awareness of traditional and 'new' media, its influence on perceptions and the different media platforms which exist 	<ul style="list-style-type: none"> Managing different media formats (i.e. video, audio, text, graphic) 	<ul style="list-style-type: none"> Critical and creative attitude towards consumed media

Digital Competence			
<i>Competence component</i>	<i>Knowledge</i>	<i>Skills</i>	<i>Attitudes</i>
<i>Communication and collaboration</i>	<ul style="list-style-type: none"> ▪ Understanding of society's 'appropriate' or accepted online and offline social conduct ▪ Understanding of differences in social and formal/professional forms of online communication 	<ul style="list-style-type: none"> ▪ Applying interpersonal skills in appropriately communicating with others, on and offline ▪ Sharing, expressing and presenting information online ▪ Working in collaboration with others 	<ul style="list-style-type: none"> ▪ Positive attitude towards sharing of information and knowledge, and collaborating with others
<i>Real-time thinking</i>	<ul style="list-style-type: none"> ▪ Understanding of the nature of more interactive digital environments which operate in 'real' time 	<ul style="list-style-type: none"> ▪ Immediately processing and responding to multiple incoming stimuli 	<ul style="list-style-type: none"> ▪ An open mind-set to participate in increasingly modern and interactive digital environments
<i>Creation of content</i>	<ul style="list-style-type: none"> ▪ Awareness of the existence of online user-generated content 	<ul style="list-style-type: none"> ▪ Organising, integrating, editing, designing, inventing, applying and presenting digital content 	<ul style="list-style-type: none"> ▪ Sense of confidence to produce and share content online
<i>Transferable</i>	<ul style="list-style-type: none"> ▪ Understanding of personal goals and how technology can assist in attaining them 	<ul style="list-style-type: none"> ▪ Applying more thoughtful critical, creative and strategic thinking in the use of technology ▪ Applying sense-making and problem-solving skills in the use of ICT 	<ul style="list-style-type: none"> ▪ A critical and creative attitude in using technology ▪ Motivated to continuously learn and improve personally and professionally throughout life



5.1.3 Delivery approach

5.1.3.1 Raise awareness

e-Skills development programmes – particularly those focused on smaller, marginalised communities – have to actively raise awareness of and stimulate interest in the benefits of ICT and the availability of training and services. Digital marketing campaigns (e.g. websites and social media) may be effective in more established centres, catering to a larger geographical area. In more digitally excluded communities, traditional forms of outreach activity are perhaps a more appropriate means of attracting non-users. These methods include distribution of pamphlets, advertising in local newsletters, word of mouth and active ways of personally engaging with community members. Establishing alliances with local institutions (e.g. schools or community organisations) may be useful in reaching larger groups.

5.1.3.2 Provide access

While providing new equipment may be beyond the scope of e-skills initiatives, the provision of open-source software as well as the incorporation of offline material could make a significant contribution to community e-centres – largely the only source of access for many. Where possible, access to the e-centres should be free and the operating hours extended as far as possible.

5.1.3.3 Develop a tailored and contextualised initiative

It is vital to consider the contextual factors of a group or community when implementing a DI training programme. Factors pertaining to the particular geographical location and community members must be considered in the design of such an initiative (or in the adaptation of an existing programme). Particular care should be taken to ensure that the choice of technology, language of the programme and local infrastructure is appropriate. Content should be relevant, meaningful and as closely related to the specific needs of the target group as possible. Where this cannot be achieved, generic content should be used that is related to the interests and needs of the province as a whole. Original, interesting material may also be included to promote critical and creative thinking and prevent the boredom that might result from overused subject matter. Including trainees in the process of acquiring and selecting content (instead of dictating the material to be used) may also be a

useful method of attracting or maintaining trainee interest. Although content should not be the main focus of the course, it is vital to select content that is appropriate for the specific target because of the role of this plays in promoting learning.

5.1.3.4 Focused target groups

The programme should as far as possible be tailored to target specific groups, and not adopt a blanket approach. It should provide learners with whatever skills or knowledge they personally require at that specific time. This approach is particularly suited to groups of learners with the same interests, needs or from similar professional disciplines.

5.1.3.5 Avoid skills-based separation

The great complexity (and often bias) involved makes separating learners according to skill levels inadvisable. Exposure to different perspectives and insight from others with different skills or knowledge is more valuable to some than the acquisition of actual e-skills or digital competence. Adopting a 'mixed skills' approach also promotes a culture of sharing in which individuals work together, accumulate knowledge and encourage one another. However, providers are cautioned not to allow the more skilled trainees to assist others to the extent that their own work or learning suffers. They should also ensure that the less skilled are not intimidated by the activities or their more advanced peers and that they keep up to date. A properly designed course with appropriate e-tools makes it possible to train diversely skilled citizens simultaneously.

5.1.3.6 Demonstrate maximum quality of ICT use through parallel learning

The e-skills programme should be conducted in such a way that learners have the opportunity to learn to use meaningful and more advanced forms of ICT. This should occur during a process of parallel learning, in which trainees are taught basic e-skills by being given the chance to interact with modern ICT platforms, applications and software that hold greater meaning and potentially yield more benefits.

5.1.3.7 Blended learning

This model encourages the adoption of a blended learning approach, integrating online and face-to-face learning. This offers the benefits of face-to-face learning, and reduces the problems of poor access and infrastructure in marginalised

communities. This combination is also useful for developing the necessary attitudes (previously identified) during face-to-face training, while allowing for the individual to continue working in the comfort of his or her own personal space or community during the online phase. This strategy incorporates blended approaches within the main approaches, as face-to-face learning should consist of group work and individual accountability to obtain maximum value out of the training.

5.1.3.8 Formal, informal and innovative strategies

The incorporation of informal along with formal training methods allows for the development of digital competence to reach a far greater number of excluded citizens. The use of innovative methods such as including volunteers, train-the-trainer, peer learning and inter-generational approaches is encouraged as complementary to formal e-skills programmes.

5.1.3.9 Adopt a learner-centred approach

Learners should be kept informed, prepared and have their expectations addressed. Providing relevant reading material ahead of time or simply informing them of upcoming course activities is beneficial for slow and nervous learners and may assist in making the training more productive and valuable for the group as a whole. A good understanding of the learner expectations may assist the trainers in deciding which areas of the curriculum need more time or attention than the programme has assigned to them.

Facilitators or trainers should create a safe space for learners by being friendly and welcoming, removing fear and apprehension, building trust and creating a relaxed, sociable atmosphere, which encourages interaction while maintaining order and structure.

Training should occur at a relatively slow pace, which considers the learning pace of all, particularly slower individuals. This approach ensures that all learners are at the same level before progressing to a new learning objective. This would prevent some trainees lagging behind or finding the training unproductive. **Time allocated to each new section of learning must be sufficient** to ensure that the work is understood by all. Failure to do so may reduce the value of the course for trainees.

Training should accommodate small groups of learners. The exact number is difficult to define since it would depend on the scale of the initiative. However, the size of the group must be small enough for each learner to have a computer and learning space; and the ratio between facilitators and trainees must be sufficiently high for each learner to be adequately assisted, particularly in a situation where basic literacy levels are generally low.

5.1.3.10 Manage poor levels of education

e-Skills training may be an opportunity to increase levels of basic literacy through interaction with appropriate ICT that is designed to assist in this process. Where this is not an objective of the training, methods such as group work are useful in overcoming the challenges presented by poor basic literacy levels. It is particularly necessary for facilitators to choose vocabulary that will be understood by all. Particular e-tools also have the potential to significantly counter challenges related to literacy levels. An example of this is video or audio-based content on websites that promote these platforms. In certain cases (depending on the target group and type of training initiative), collaborating with educational institutions may help to combat the lack of e-skills and basic literacy.

5.1.3.11 Adopt a multi-stakeholder approach

Successful large-scale e-skills development programmes require a multi-stakeholder approach, where all invested parties are fully aware of the objectives and strategies involved in the programme, as well as their specific roles (and boundaries) in attaining the defined goals. A good approach integrates bottom-up and top-down strategies: the targeted group or community is considered and treated as an equally important stakeholder, actively involved from design to implementation and assisted by the necessary resources of top-down strategies.

5.2 Proposing a conceptual framework

5.2.1 Description of conceptual framework

The areas that have been discussed – DI, digital competence and delivery approaches – do not exist in isolation but are closely interrelated. The following conceptual framework (see Figure 18) sets out a way in which the identified commonly digitally excluded groups face and overcome barriers to DI through a

targeted approach. This delivery approach should result in the development of required digital competences, which play a vital role in ensuring that the outcomes and the desired impact of DI are attained.



5.2.2 Towards the development of Digital Competence for Digital Inclusion in the Western Cape

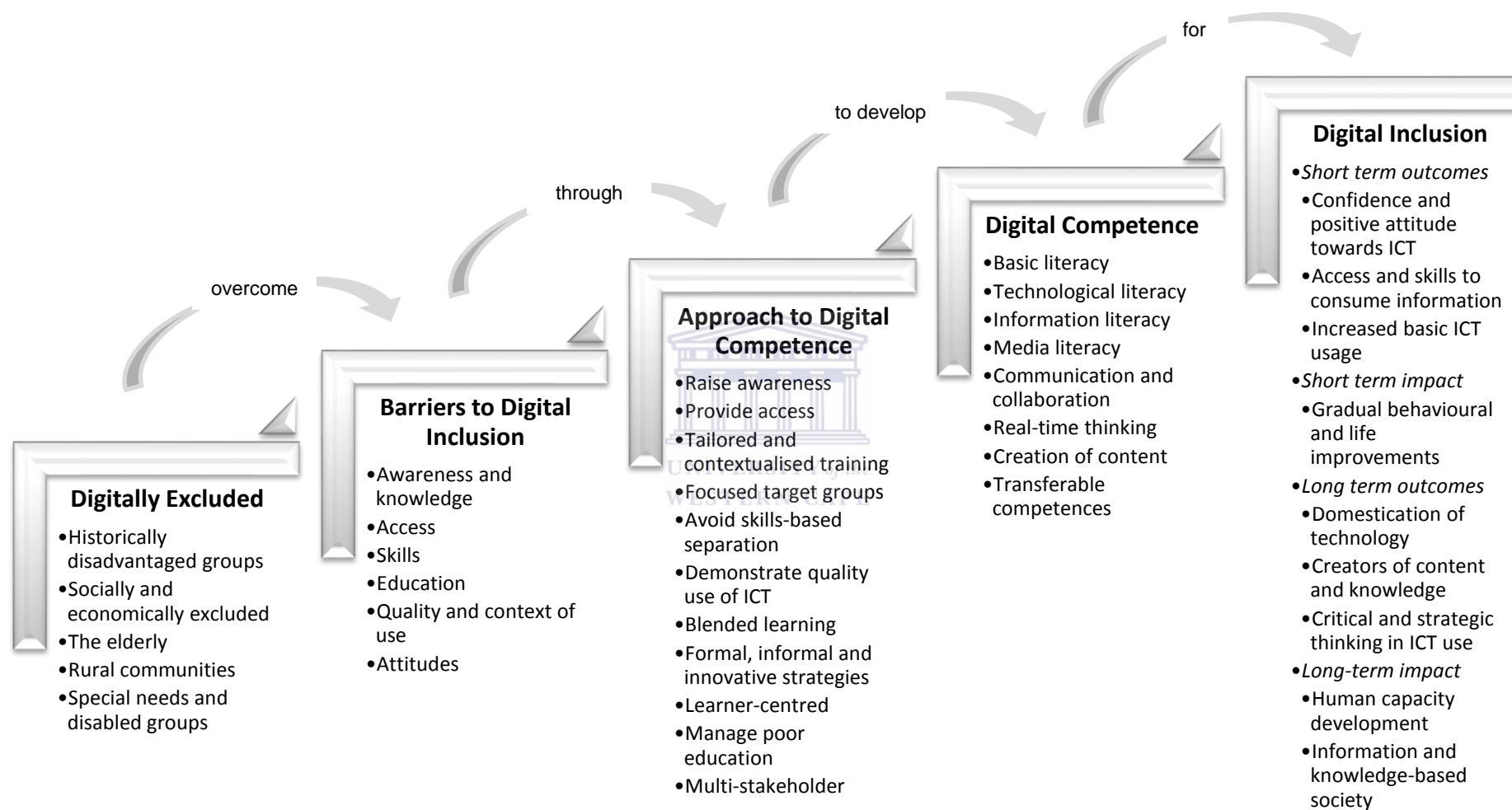


Figure 18: Towards the development of Digital Competence for Digital Inclusion in the Western Cape (Source: Author)

CHAPTER 6: CONCLUSION AND RECOMMENDATIONS

6.1 Introduction

This study has explored the development of e-skills for digital inclusion (DI) in the marginalised communities of the Western Cape (WC) of South Africa. It has sought to obtain information on this matter, which is often vague and elusive, but even more so within the context of a developing country. The research has aimed to understand the conceptualisation of DI, identify appropriate e-skills required to attain its objectives and provide suitable guidelines for providing these skills. In addition, it has identified the groups that are typically digitally excluded in the WC region, as well as the barriers responsible for their exclusion. In order to increase understanding on each of these aspects, this study has focused on fulfilling the following objectives:

1. Gain conceptual clarity of digital inclusion and the identification of barriers to its attainment;
2. Clarify the meaning(s) of e-skills for digital inclusion and clusters of e-skill sets for digital inclusion;
3. Identify appropriate approach guidelines to develop these e-skills;
4. Develop a conceptual framework related to e-skills for digital inclusion in the WC

6.2 Meeting research objectives

The objectives of the study were achieved through the review of related literature and qualitative data collection and analysis. Data were collected during interviews with the e-skills trainees and trainers involved in the e-skilling for DI initiative, implemented by the Western Cape e-Skills Knowledge Production and Coordination CoLab. The CoLab is situated at the University of the Western Cape and focuses on provincial community e-centres – the majority of which are located in and serve so called ‘marginalised communities’. The analysis of these interviews together with the findings from the reviewed literature made it possible for each of the objectives to be fulfilled and presented in Chapter 5.

6.2.1 Objective 1: Gain conceptual clarity of digital inclusion and the identification of barriers to its attainment

The first objective sought to gain conceptual clarity on the commonly referred to but rarely clearly defined concept of DI, as well as identify the target groups of inclusion efforts and the key barriers they typically face. It was found that DI was focused on broader developmental goals rather than on technology. This stems from an underlying recognition that knowledge is a key determinant of progress and development so the goal should be to develop an information and knowledge-based society. Given the generally vague nature of definitions of DI, the findings of this study suggest that it may be useful to deconstruct and consider the subject in terms of short and long-term outcomes and impacts. At a practical and short-term level, DI calls for increasing basic ICT usage in personally relevant ways, enabling largely digitally excluded communities to have the skills and means to access information. It is envisaged that these seemingly minimal objectives result in gradual behavioural changes leading to an improved quality of life. The assumption of DI is that over time, this relatively basic and somewhat limited interaction with ICT results in a more thorough domestication of technology in all facets of users' lives for enhanced benefits. Passive consumers of information are thus transformed into active creators and contributors of content and potentially knowledge. Critical and strategic thinking skills are developed and become a substantial factor in what was previously only technically-focused use of technology.

Overall, DI is aimed at addressing social exclusion and the socio-economic inequalities in society. This is specifically relevant in the WC considering the magnitude of developmental challenges faced by disadvantaged groups. This objective is related to the concept of social innovation, i.e. developing solutions for the WC's marginalised communities to overcome socio-economic challenges by means of ICT. In addition, DI ultimately hopes to be engaged in human capacity development and individual and community empowerment and upliftment. In the WC, the digitally excluded are generally the historically socially and economically disadvantaged, linguistic (non-English natives) and ethnic (non-White) minorities as well as rural, elderly and special needs groups. Barriers commonly faced by these citizens include lack of awareness, access, education and skills; less than meaningful use of ICT; and negative attitudes to technology.

6.2.2 Objective 2: Clarify the meaning(s) of e-skills for digital inclusion and clusters of e-skill sets for digital inclusion

This objective set out to identify the e-skills necessary to conceptualise DI, as discussed above. The findings revealed that the requirements of DI extend further than skills to a combination of knowledge skills and attitudes; awareness of the benefits and particularly attitudes to the use of ICT play a significant role in DI. In light of these findings, the notion of 'e-skills' for DI was replaced by 'digital competence' for DI. Findings revealed the digital competence components as: (i) basic; (ii) technological; (iii) information-related; (iv) media-related; (v) communication and collaboration; (vi) real-time thinking; (vii) creation of content and; (viii) transferable competences.

Along with the complexity of knowledge, skills and attitudes revealed within each competence component, the findings also indicate that requirements extend far beyond basic technical abilities. They are increasingly centred on the cognitive aspects, which are much more challenging to develop. However, it is not always necessary to include the full range of competences from the outset. The first five of the competence components are closely related to the short-term intentions of DI. They entail basic use of ICT for retrieving information and attaining relatively simple benefits. Real-time thinking, the creation of content and even critical and strategic thinking (transferable competence) are not necessarily imperative in these initial objectives but do come into play over the course of time to make full participation possible and to capitalise on the broader opportunities and benefits afforded by technology. These latter competences make active contribution to the knowledge society possible, rather than merely passive consumption of information. This creates the possibility of a role in the formation of dominant narratives and pertinent societal issues. Furthermore, they play a substantial role in the broader impact areas of DI, specifically fuller participation in society, empowerment of disadvantaged groups which often allows for citizens addressing their own local developmental challenges, working towards a knowledge-based society and lessening socio-economic inequality.

6.2.3 Objective 3: Identify appropriate approach guidelines to develop these e-skills

Following the findings of the second objective, the third objective, related to e-skills delivery approaches may be referred to as digital competence approach guidelines. Findings have indicated that raising public or community awareness of the availability and importance of digital competence training should be a significant initial step in these development programmes. This inevitably includes some attention to challenging negative attitudes to the use of ICT. While these programmes offer limited increase in access to communities, certain measures such as the provision of relevant offline material is possible and useful. It is important that training programmes be tailored to suit specific target groups rather than adopting a blanket approach. This emphasises the importance of a strategy which is contextualised and appropriate to the circumstances of the community, as well as using content that is relevant to the target group in question. While distinguishing between target groups is advisable, separation based on skill levels is not. In some cases an amalgamation of skill levels may actually be beneficial and result in a form of learning beyond the intended scope of the curriculum (i.e. trainees with different backgrounds gain new perspectives and knowledge from one another).

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Poor levels of education should be expected in digital competence programmes targeting marginalised communities. This creates the opportunity for the training itself to be viewed as an opportunity to increase the level of the trainees' literacy skills. Where the goal is purely to eliminate this potential challenge to delivering digital competence, certain strategies may be used. These include incorporating group work or using a large deal of audio and video-based learning material. Involving various stakeholders is an effective way of pulling together knowledge, expertise, funding and a host of resources. It is important to ensure that communication between the parties is clear enough for the desired outcomes and impact of the training programme not to be compromised. It is also important to ensure that the community (or target group) itself is an integral stakeholder, assisted by the resources of top-down strategies.

In terms of actual training methods, a blended learning approach is the most appropriate one in the WC context. Face-to-face training remains imperative in this

setting and may be complemented with an online component. Blended learning also refers to combinations of individual and group work, which both have particular merits. A final guideline, which should be given particular emphasis, is that training should be learner-centred. This entails keeping learners well informed, creating a safe learning environment, keeping the training group size to a minimum, and progressing at a learning pace that accommodates the learning needs of the trainees.

6.2.4 Objective 4: Develop a conceptual framework related to e-skills for digital inclusion

The fulfilment of each of the previous objectives made it possible to propose a conceptual framework which integrates the findings and the relationships established in the relevant research sections. This framework is based on the premise that there are a large number of digitally excluded groups in the WC, particularly in underprivileged communities. The impact of technology in these areas has been minimal in comparison to the more developed provincial regions. Certain barriers exist as obstacles to bridging this gap between digital exclusion and inclusion, the most prominent being lack of awareness and access to ICT, poor digital competence to make effective and meaningful use of ICT and negative attitudes and mind-sets towards technology. This framework proposes that these barriers should be addressed by an appropriate digital competence delivery approach, which adheres to certain effective guidelines. The programme should equip users with appropriate digital competences allowing them to use technology effectively, as well as guiding and demonstrating meaningful ways to capitalise on the opportunities afforded by technology to attain a range of (social, economic, civic, cultural, health and political) benefits. The competences (discussed in detail in Table 15) are generally more focused on cognitive thinking than technical abilities. While certain competences are directly aligned to the more basic conceptualisation components of DI, the full range of digital competences are related to the broader, long-term impacts such as the development of empowered citizens, uplifted communities, increased social and economic equality and a knowledge-based society.

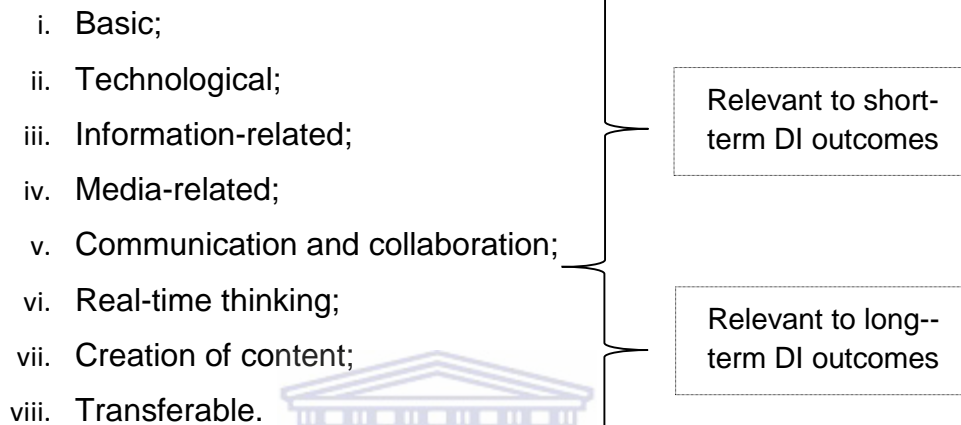
6.3 Recommendations

6.3.1 Practical recommendations

In accordance with the findings of this study, it is recommended that:

1. Digital inclusion initiatives focus on:
 - a. Reaching the typically socially and economically excluded and minority groups;
 - b. Addressing the barriers faced by the digitally excluded, specifically lack of awareness, poor access to ICT, lack of education and skills, minimally beneficial uses of ICT and negative attitudes towards technology;
 - c. Achieving realistic short-term outcomes:
 - i. Enabling users to access information;
 - ii. Increasing basic ICT usage in WC communities;
 - d. Gradually achieving short-term impacts:
 - i. Gradually changing behavioural patterns and improving quality of life;
 - e. Achieving long-term outcomes:
 - i. Domestication of technology;
 - ii. Passive consumption to active creators of content and knowledge;
 - iii. Developing critical and strategic thinking in ICT use;
 - f. Ultimately achieving long-term (broader) impacts:
 - i. Increased societal participation;
 - ii. Human capacity development (i.e. education and employment);
 - iii. Social inclusion;
 - iv. Social innovation;
 - v. Empowerment;
 - vi. Upliftment;
 - vii. Information and knowledge-based society.
2. The digital competence for Digital Inclusion curriculum should focus on:
 - a. The development of cognitive, critical thinking capacities rather than only technical skills;

- b. The significance of knowledge and attitude components of digital competence required for digital inclusion, allocating substantial attention specifically to the development of these aspects;
- c. Inclusion of the following digital competence components – bearing in mind that some are imperative for the desired short-term basic Digital Inclusion outcomes, while others (are not limited to) but may only be relevant in broader long-term impacts:



- 3. The execution of this digital competence development should:
 - a. Raise public ICT awareness;
 - b. Provide some form of access to ICT;
 - c. Be tailored to suit the local setting and context;
 - d. Incorporate relevant content;
 - e. Focus on specific target groups;
 - f. Not distinguish and separate learners based on prior level of skills;
 - g. Demonstrate ways to maximise the quality of ICT use;
 - h. Combine elements of face-to-face and online learning in the form of a blended learning approach;
 - i. Incorporate formal, informal and innovative strategies;
 - j. Be conducted according to a learner-centred perspective;
 - k. Manage poor levels of education;
 - l. Collaborate with multiple stakeholders and integrate bottom-up and top-down strategies.

6.3.2 Further research

The wide scope of the study meant that not all areas could be explored in depth. The following are highlighted as important for further research:

- *Attitudes as a barrier to DI and to the development of digital competence in marginalised WC communities.* The findings of this study indicate that attitudes to using ICT are potentially greater hindrances than the lack of physical access. The relationship between attitudes to ICT and the development of digital competence (and extent of use) should be researched. However, an under-researched area of even greater importance is WC citizens' attitudes to and lack of confidence in producing and contributing to digital content. This research suggests that a large number of previously disadvantaged WC citizens opt to remain strictly consumers and not producers of content and consequently knowledge because of affective factors such as these. This is an underdeveloped area of research in the WC context and should be given urgent attention.
- *The digital competence areas particularly relevant to the long-term outcomes of DI in the WC, specifically real-time thinking, and the creation of content and transferable competences – critical and strategic thinking.* International attention is increasingly focused on these abilities, with less attention focused on technical components. It is clear that there is insufficient research on these abilities in the WC (particularly in the largely underdeveloped areas), and difficulty in developing these skills. A great deal of further research in this area is necessary.
- *Specific digitally excluded groups lacking and requiring specific digital competence components.* This research has tentatively suggested that certain groups are generally less competent in particular digital competence areas. The elderly, for example, seem to lack in aspects such as navigation skills. While this has been identified in international literature, little has been confirmed in this regard considering the WC. More substantial information could be used to tailor curriculums to suit specific target groups. This area might therefore be worth further investigation.

6.4 Contribution

The contribution of this study is both practical and academic. The practical contribution is the advice given to the curriculum on digital competence for DI in WC communities and the guidelines given on how to approach the curriculum (see **Error! eference source not found.**). The academic contribution lies in the body of knowledge contributed to this developing area of study, in particular the clarification of the concepts of DI, e-skills and digital competence. It is hoped that the recommendations of this study are used to inform WC initiatives aimed at developing digital competence and that further research will be done on the conceptual framework provided. The researcher hopes that the WC province, through its e-skills CoLab and e-centres, will benefit from this kind of focused research, which builds on the evidence-based analysis of what is being done at present and brings together international and local knowledge. This research could make a significant contribution to meeting national priorities (as specified in NeSPA 2010 and NESPA 2013), aimed at addressing social exclusion and equipping the unemployed and most vulnerable with requisite digital skills to access new social, employment and learning opportunities and help build cohesive and sustainable communities. Finally, it is hoped that this research will stimulate thinking on DI and assist in the successful implementation of e-skills or digital competence initiatives in areas in the very early stages of DI.

6.5 Limitations of study

The relatively small size of the sample means it cannot be generalised. However, this does not affect the validity or reliability of this qualitative study (Devers & Frankel 2000). The in-depth nature of this research as well as the triangulation of data (through interviews, observations and document analysis) has enabled this study to be a rich, trustworthy and highly informative source of information. Another possible limitation is that the interpretation of this research on the state of DI and e-skills in the various communities largely relied on the reports of the community-based e-centres employees, which could mean that the findings are not sufficiently representative of the marginalised WC communities. However, the fact that these individuals have daily interaction with community members makes them the most knowledgeable sources of information on the state of digital engagement in their communities (being the facilitators of largely the only form of access to ICT in many

of these areas). They are also local members of the respective communities, which gives them valuable 'insider' knowledge. Yet another possible limitation is that the study does not measure the various competence areas, some of which are extremely difficult to measure even in formal standardised assessments. The study therefore relied on the opinions and insights of the interviewees, which again could mean that they are insufficiently representative. However, it should be recognised that the WC CoLab representatives (higher organisational level and those specifically providing training) are able to provide extremely valuable insight into the entire range of trained e-centre employees, and complement the findings derived from of the e-centre employees, thus contributing to an overall perspective of the WC conceptualisation of DI, the digital competences for DI and suitable delivery approach factors.



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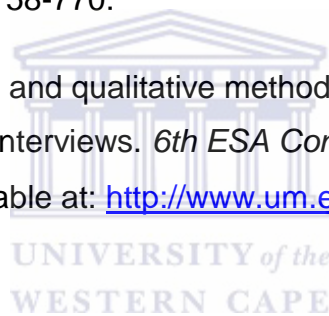
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APPENDICES

Appendix A

Interview questions

The following are lists of questions posed to the sample group. Given that the semi-structured interviews took the form of a conversation between researcher and participant, these questions served as a general guideline only. Some are more relevant and significant than others and certain sections tend to overlap leading the researcher to use her own discretion in posing the questioning.

Trainee (e-centre employee) questions

1. Do you think learning e-skills (computer/ICT skills) and being able to use technology are important? If so, why? Are there any ways that you think technology and having these skills can help you or people in your community? What do you think people need e-skills for?
2. Did your view of the importance of e-skills and how it can help you and your community change during training?
3. Would you say the skills you learned are useful to you?
4. What are the main things that people use your computer centre for?
5. What kind of demographic profile generally uses the centre?
6. Have you been for any other computer/e-skills training before this?
7. Were there other skills that you wanted to learn that you didn't? If so, did you ask the trainers about them?
8. Do you know anything about the risks in using technology (e.g. cybercrime, viruses, privacy issues, legality?) Did you know these things before or did you learn during training?
9. Do you use the Internet to find information? Do you know how and where to find specific information? Did your knowledge of this increase during training (learn new resources you weren't aware of)?
10. **For trainee with visual impairment:** Did you have any sight related issues with the training or the assignments? Do you think the programme caters for and considers people with visual impairments? Are the kinds of things you learned actually suited for people who use your centre?
11. Did you have any problems in the training or with doing your assignments because you struggled with reading/writing/counting?
12. If yes, did you get help from a trainer?
13. Do you think the training helped with your reading/writing/counting skills?
14. Do you think the programme was too text-based?
15. Are you comfortable with different computer functions like using the Internet, typing a document and sending an email?
16. Did you know many of the tools or programmes before training? Which ones?
17. What (if any) of the applications or skills have you taught to people using your centre?
18. Have you had any difficulty from people higher up or your bosses when you wanted to do training courses with people coming to your centre?

19. Which of the applications, programmes, skills do you really make use of (either for personal or professional use)?
20. If you don't use the tools or newly acquired skills, what's your reason (e.g. no use for them in daily life; you find them too difficult)?
21. Was there any part of the course you found particularly difficult or challenging?
22. As part of the course you were required to locate information from different sources (Internet, info resource bank and from the community members etc.) in different formats regarding a specific theme/topic and compare, analyse and use/apply it in your assignments. Would you say you struggled with any of these tasks or any part of this process (finding appropriate information or using it in the way that was required)? Which part?
23. How did you find it to gather information from community members and then analyse the information?
24. Did you draw up your own questionnaire? If yes, did you struggle with formulating appropriate questions?
25. Was it difficult to summarise the information that you got from your interviews and use it to determine things like how you can improve your centre?
26. Can you judge what information is useful, relevant or reliable (trustworthy)?
27. Do you find it easy to find information on the Internet when you looking for something specific? Do you sometimes get confused by the structure of the Internet with different random links everywhere which can lead you in all sorts of different directions? Do you find that your centre users or community members often get overwhelmed or confused when searching the Internet?
28. Are you able to work with different media formats e.g. text, video, audio, images? Do you find it easy when you are working with a format that includes different mediums at the same time (e.g. building the digital photo-stories which might include writing and reading (text), working with pictures (images), and recording your own narrative (audio)? How do you find having to include/work with these different formats in one activity/task?
29. Do you use Skype, Webex, Gtalk or play any interactive online games?
30. There's a difference between working on something, saving it and working on it at your own pace/time versus online and interactive formats e.g. games or Skype where you need to interact online and have information thrown at you in different forms like text, video, audio, images and you need to take it all in, understand what's going on and respond immediately. How have you found coping with or handling all these forms of media at the same time and then responding/interacting immediately in real time/ live? Do you sometimes feel a bit overwhelmed or that it's too much to handle?
31. Do you normally trust information from the media? Do you carefully think about information you find online and evaluate different things you hear/read about in the media before you trust it/ form an opinion or make up your mind?
32. When you created your own digital photo-stories/ podcasts etc. did you make it about a subject that was important in your own community? What kind of issues/themes did your content focused on?
33. Can you take information from different sources (e.g. something from the information resource bank, with a picture you googled and with an audio clip perhaps) and put it together in a way that makes sense to make something new or your own document/story? Example: If I were to ask you to think about a real problem in your own area, could you get information together from those different kinds of sources and present a digital story/document to show me what's going

on? Can you use different pieces of information and put it together to create something new that's actually relevant to your own circumstances?

34. Can you add content or your opinion to media, blogs, discussion forums etc.?
35. Would you say that you needed to put a lot of thought into it when you had to create these kinds of stories/articles/videos/podcasts? Thought in terms of how to technically create it (where to click at what point etc.) or about what you are actually creating in terms of content and what your article is about and what message you want to deliver through your story?
36. What kind of communication do you have in e-form? Can you interact with people online? Do you use ICT to interact with your community, local groups or organizations? Do you use ICT to engage with people outside of your community (e.g. discussion groups and forums)? Did you have this interaction before training?
37. Do you have any of these accounts: Facebook, Twitter, Whatsapp, Mxit, Bbm? How active would you say you are (How often do you use it)? How active would you say the centre users or community members are on these different platforms?
38. Do you use social media just to chat to and keep track of friends or for any other purposes (e.g. marketing your centre, business, entertainment, obtaining news/weather etc.)? Does your centre have a separate social media account?
39. What did you think of having to discuss topics on the discussion forums during the online phase of the course?
40. Do you handle any service delivery or governance processes online? Do you help people who come to the centre with any kind of online government service? What kind of municipal or local government services does your centre offer online (if any)? (e.g. online municipal enquiry and application forms)?
41. If yes, did you do offer these services before the training or is it a result of skills learned during training?
42. Do you know how to share information online? Do you collaborate with people online besides socially and share any information and ideas?
43. How did you find/like the group work parts of the course? Do you find it difficult to work with other people and would you prefer to just work on your own?
44. I know you had to do presentations in the course. How did you find this? Was it difficult speaking in front of everyone and communicating/presenting your work?
45. Would you say you learned any other life skills during training besides digital skills?
46. What did you think about the face-to-face part of the course? Do you think that having people there to help and support you during the face-to-face part helped you or not? Was there anything bad or that you didn't like about the face-to-face training?
47. Did the face-to-face training prepare you enough that you could do the online/self-learning part alone?
48. Did the face-to-face training in any way help you in your own centre where you work with people face-to-face?
49. What did you think of the online learning phase? Was there anything that you really liked or disliked about this part of the training?
50. Did you miss the social part of the learning (being around people) when you had to do the online/self-learning phase? Did you have any other kinds of problems with the online part that you didn't have with the face-to face (e.g. less motivated, didn't understand)?
51. Do you prefer the face-to-face or online learning phase? Why?

52. Did you think the course was too long?
53. What did you think of the assignments? Were they too difficult or were you able to complete them easily? Which part was difficult?
54. Did you form a relationship with the other centre managers (or trainers)? Do you keep in touch with any of them?
55. Were you satisfied/happy with the number of people in your training group (there weren't too many people and you got enough attention and help when you needed it)?
56. Could you keep up properly with the teaching? Did you have enough time to work on one thing and understand it properly before they moved on to the next tool? Was the training perhaps too slow and did you get impatient?
57. Was it step-by step instructions?
58. Was there someone to give you extra attention or work with you one-on-one if you were struggling or needed help? Did you get enough support/help from the trainers?
59. Did you feel safe and comfortable in the training room? Was there anything that the trainers did that made you feel comfortable/relaxed or uncomfortable?
60. Were the trainers friendly and approachable?
61. Did you feel like you could ask any of the trainers for help or were you more comfortable with certain trainers, e.g. someone more similar to your age/gender/language/race/background? Would you have preferred someone more similar to yourself (if there wasn't)?
62. Was the atmosphere or the feeling in the training environment more formal/stiff/structured or more casual/laidback?
63. Could you ask questions at any time?
64. Could you ask to be taught things that weren't in the programme as you went along?
65. Did you feel that the group you were trained with was quite mixed in the sense of the level of skills they entered the programme with (did some know a lot more than others)?
66. Were there any problems with having differently skilled people in one training group? Was equal attention paid to people of different skill levels?
67. Did you find it difficult to understand the trainers or the work assignments because it wasn't in your own language? Were you referred to websites that were in your own language?
68. Do you feel any more comfortable with or better able to communicate in a language other than your own now after the training?
69. Before training began, were you included in any meeting and asked about your personal or your community's needs/expectations (what you need and want out of the project)?
70. Do you feel that what the programme teaches is what you or your local community need or that it's not really suited (do you think the things that you were taught apply to and are needed by your community or that it's more for places different in culture/wealth/environment etc.)? Does it somehow address real local problems; can it help people with things that they actually need help with in their normal daily lives?
71. I know the content of the programme related to being an e-centre manager and you learned skills which are supposed to help you in that capacity (marketing, business etc.) Did you find this useful in running your centre and has it helped you in any way? When you train people at your centre or teach anyone any of the skills you've learned, do you use content that relates to that particular person?
72. What are your thoughts on the certificate you received (or will receive?)

73. How have your computers been maintained (who fixes things)? What happens if there's a breakdown?
74. Is the equipment at your centre up-to-date?
75. Is the Internet speed ok?
76. Do you have all the equipment and software programmes at your centre for everything you were trained in?
77. Do you have access to your own personal computer or laptop?
78. Do you know of any NGO or local organization in your community who's been involved in the project?
79. Do you think they should have another more advanced course for those that already have skills?
80. Is there anything that you'd change about the project or any recommendations you can think of?

Trainer (e-skills provider) questions

1. What in your opinion is the aim of this e-centre training; besides just teaching people how to use ICT what are you really trying to achieve in getting them and their communities to be skilled? How do you think or hope this is benefitting them?
2. Is your training designed and rooted in the specific needs of what could help people in daily living? How?
3. Do you think trainees were really aware of the potential benefits of technology and ICT before the course and do you think they are now?
4. How did you go about making them aware? (Did you have actual discussions about the benefits that technology has to offer incorporated into the curriculum and training?)
5. Do you teach anything about the risks of using technology/ICT (e.g. cybercrime, privacy issues, and legality)? Are they taught how to apply any security measures?
6. Do you actually discuss the importance of information (and the information and knowledge society)?
7. Why did you choose to exclude Excel, Word and the more traditional tools and software, in favour of the tools you've included? How do you see those as being more beneficial?
8. Would you say that with this move away from the more 'old school' traditional skills, your programme also moves away from a focus on the technical skills? How do cognitive (thinking) skills fit in (if they do)? Do you actually focus on training and developing cognitive (thinking) and critical thinking skills in the programme or would you say it's mainly just concentrated on the technical aspects?
9. Do you have a general idea of trainees' basic literacy levels (reading, writing, numeracy) before they enter the training? What are the average levels of basic literacy?
10. Have you had any problems during training due to poor literacy and how have you handled it? Is the programme adapted for low literacy trainees; how do you cater to low literacy levels?
11. In terms of the tools and applications that they were taught, what did people struggle with? What, if anything, did they really seem to enjoy?
12. I've seen that your programme incorporates information literacy skills and that trainees need to be able to locate, select, organise, interpret, analyse, evaluate, synthesise and apply information? How do most people fare with these different processes?
13. How much attention is paid to Internet navigation skills?
14. I know you taught people to work with different media formats, text, video, audio, image and it seems like you tried to focus on one aspect at a time as much as possible and then combine it.

How did people fair when they had to work with various forms being pushed at them at the same time?

15. It's different being able to work on something in your own time and pace, store and come back to it as opposed to having to deal with it live in real time (e.g. virtual games and Skype) where you have to react immediately? How did they deal with that?
16. Do you have a session in the course where you actually discuss the media and its effect on us/society and how it influences how we think?
17. Would you say that the course aims and works on developing critical thinking skills? To what extent is it a focus of the course?
18. Would you say that all of the participants are now able to you use different pieces of information and put it together to create something that's actually relevant to their own circumstances?
19. Is generating their own local content an intentional focus of the programme?
20. Is there any part of your curriculum/programme that you'd say is specifically designed or included to increase the social participation of these people in society or their communities?
21. Does the curriculum cover e-governance or any kind of online service delivery?
22. Were group activities incorporated into the course or assignments? How did that go? Was there a specific reason for including group work or was there any significance in it?
23. How did the presentations go; how did people fare? Did you encounter any problems?
24. Was there any discussion about the emotional/sociological/interpersonal skills needed in social media?
25. Do you think the course (whether directly or indirectly) includes life skills or skills which are used both in and out of digital contexts (e.g. learning to learn, cultural awareness, creativity, responsibility, problem-solving)? Have you been able to see any of these or any kind of change or personal growth in any of the people?
26. Is there anything else you'd like to add about the skills taught that you think is important and wasn't touched on yet in the interview?
27. Was the context of the country (as a developing country) carefully considered in this initiative? Were our specific cultural, environmental, economic, political and organisational factors carefully considered?
28. This seems to be a one size fits all approach in terms of incorporating different skill levels. Is that accurate? Have you experienced any problems as a result of this strategy? Were different digital literacy levels catered to in a way where the more advanced students benefitted as well as the students who entered with very low level skills?
29. Do you think a blanket approach is a more effective strategy than targeting specific groups?
30. Did anything change in curriculum or training approach between the 2011 and the 2012 groups?
31. Did you as trainers need to update any of your own skills or learn anything new for the 2012 phase?
32. Is being friendly, approachable and welcoming as trainers something that's important and discussed prior to training?
33. Is the training only in English? How do you deal with students of different languages in one group and make sure that everyone understands what's being taught?
34. Do you think that language was a barrier in any way in terms of the actual teaching of the skills or the social component of the teaching environment?

35. Have you noticed (especially in the pilot phase group where you've had longer contact) that some of the people's language skills have improved over the course of the project?
36. Was the content used in training in the native language of the student? Were websites in the different native languages identified?
37. In what languages are assignments completed?
38. What kind of atmosphere does the training room have (laidback, sociable or more formal and structured)?
39. You have a face-to-face and an online component. Can you tell me a bit more about both?
40. Why do you think a face-face phase is important? How important and in which ways do you think the face-face social interaction between trainer-student and between students is?
41. Would you say students seemed to prefer online or face-face learning?
42. Is the online section of the course designed as complementary to and building on the face-to-face training already received?
43. What sort of problems (if any) did you have during the different phases? What sort of difficulties did students have during different phases?
44. Was there a noticeable difference in results (assignment marks and how students fared) during the face-to-face and online phases?
45. What were the main reasons for people failing or dropping out?
46. What's the extent of your contact with students after training? Do students continue to participate on the group page or are they involved in any form of social networking with each other to your knowledge?
47. Do you have a variety of trainers from different backgrounds, ages, races, genders and religions? If so, is this a coincidence or intentional? Did you feel/notice that any of the students were more comfortable interacting with someone more similar to them in any particular way or was this not a factor at all?
48. Would you say the training experience was better with the 1st smaller group than the second bigger one? Why and how? Did a bigger group change the experience in any way? Were any problems encountered when dealing with a bigger group?
49. What would you say the learning pace was like? Were any people falling behind? Were some people getting impatient? Did the class move on as a whole when everyone was ready or did students progress to the following activities at their own pace?
50. Was it a step-by-step learning process (everyone instructed one step at a time)?
51. Did the programme incorporate what the students actually wanted to learn and take their requests and needs into consideration as you went along? Were students encouraged to ask questions or request more time if they needed it?
52. Was there separate personalised coaching for whoever needed extra attention?
53. I know that the content you used directly related to them in terms of business/marketing and running an e-centre effectively. How was this received by them and, from what you know, have they made any real use of it?
54. Have you been able to see any real progress or improvement in any of these communities or individuals which you can ascribe to the training?
55. What have been your main challenges throughout the programme? Is there anything you wish to change in future?

56. Were you able to physically visit all of these centres and have interaction with the communities before training? If not, do you think that not having interaction with the community has been to the detriment of the project?
57. Are the centres strictly there for computer use or do they all provide additional or complementary services (e.g. job preparation, job placement, childcare, language assistance)?



Appendix B

Consent form

CONSENT TO PARTICIPATE IN RESEARCH

Title:

Towards a framework for the development of e-skills for digital inclusion in the Western Cape

You are asked to participate in a research study conducted by Ms Carlynn Pokpas, a Master's student at the University of the Western Cape.

This research study is partially conducted towards the completion of the researcher's MCom (IS) thesis at the University of the Western Cape.

You were selected as a possible participant in this study because you are an e-centre manager or employee who participated in the Western Cape e-Skills Knowledge Production and Coordination CoLab's e-skilling project.

The researcher has obtained the permission from the University of the Western Cape to conduct this study.

1. PURPOSE OF THE STUDY

The main objective is to gain conceptual clarity about digital inclusion, pertinent e-skills and suitable approaches towards the development and adoption of e-skilling for digital inclusion for the Western Cape.

2. PROCEDURES

If you volunteer to participate in this study:

1. I, the researcher, will come to your e-centre at a date and time convenient to you and conduct the interview face to face.
2. You will realize that the interview is semi-structured and will unfold depending on your answers.
3. The interviews will be recorded using the tape recorder, with your permission.

3. POTENTIAL RISKS AND DISCOMFORTS

No potential risks are envisaged at this stage. However, if something might come up, it will be dealt with in a sensible and sensitive manner.

4. POTENTIAL BENEFITS TO SUBJECTS AND/OR TO SOCIETY

This study will aim to help the Western Cape in its effort to provide citizens with needed e-skills to receive the potential benefits associated with digital inclusion. Its findings may also assist UWC in future training courses by gaining valuable insight and perspective from previous trainees.

5. PAYMENT FOR PARTICIPATION

No payments to the participants will be made.

6. CONFIDENTIALITY

Any information that is obtained in connection with this study and that can be identified with you will remain confidential and will be disclosed only with your permission. Confidentiality will be maintained by means of referring to the interviewees as participant and by means of themes and categories that will be identified and used in the analysis and discussions of the findings and the outcomes, in the research report, the thesis, and in conference papers and articles that would be submitted for possible publication in academic journals.

The researcher further pledge that any information given by participants will be handled in the strictest confidence, and that the information interviewees give will not be used to reflect negatively on them in any way.

7. PARTICIPATION AND WITHDRAWAL

You can choose whether to be in this study or not. If you volunteer to be in this study, you may withdraw at any time without consequences of any kind. You may also refuse to answer any questions you don't want to answer and still remain in the study.

8. IDENTIFICATION OF INVESTIGATORS

If you have any questions or concerns about the research, please feel free to contact me at (021) 903-0710 (h); (cell) 079 936 6939; e-mail 2443208@uwc.ac.za

9. RIGHTS OF RESEARCH SUBJECTS

You may withdraw your consent at any time and discontinue participation without penalty. You are not waiving any legal claims, rights or remedies because of your participation in this research study. If you have questions regarding your rights as a research subject, contact Dr Zoran Mitrovic, Development of Information Systems, room 4.38, Level 3, EMS building, UWC, or telephonically, (021) 959-2162; or via e-mail at zmitrovic@uwc.ac.za.

SIGNATURE OF RESEARCH SUBJECT OR LEGAL REPRESENTATIVE

The information above was explained to *me, the participant* by Ms Carlynn Pokpas in *English*. *I have* good command of this language. *I* was given the opportunity to ask questions and these questions were answered to *my* satisfaction.

I hereby consent voluntarily to participate in this study. I have been given a copy of this form.

Name of Subject/Participant

Name of Legal Representative (if applicable)

Signature of Subject/Participant or Legal Representative

Date

SIGNATURE OF INVESTIGATOR

I declare that I explained the information given in this document to _____
[*name of the participant*]. He/she was encouraged and given ample time to ask me any
questions. This conversation was conducted in *English* and *no translator was used*.

Signature of Investigator

Date



Appendix C

Information Sheet

Carlynn Pokpas

Towards a framework for the development of e-skills for digital inclusion in the Western Cape

The study information sheet

With regard to the issue of digital inclusion, there has been a shift in focus from access, to the development of e-skills to build a digitally inclusive society, enabling citizens to improve their own lives at a social and economic level. The Western Cape e-Skills Knowledge Production and Coordination CoLab was set up to implement such an e-skilling for digital inclusion initiative. However, there is a lack of theoretical, contextual and methodological research to guide or inform the successful achievement of this goal in a South African context. Speculation and confusion continue to exist around what is implied by digital inclusion and its intentions, what the e-skills for this type of inclusion may be and what approaches are necessary in delivering these skills.

This study proposes to gain a more nuanced understanding of e-skills for digital inclusion by achieving the following objectives:

1. To gain definitional and conceptual clarity of digital inclusion and the identification of barriers to its attainment;
2. To clarify the meaning(s) of e-skills for digital inclusion and clusters of e-skill sets for digital inclusion;
3. To identify the most effective and appropriate approaches to develop these e-skills;
4. To produce a set of proposals and recommendations for the development of an e-skilling for digital inclusion framework in the Western Cape.

It is envisaged that this framework would form the basis of further research and could help practitioners to make informed decisions on appropriate strategies and policies.

Appendix D

Training Programme

Western Cape Knowledge Production and Coordination Hub
Digital Inclusion: eCentre Management Training Programme
12-16 March 2012
University of the Western Cape

DAY 1:

09:00-09:20 Welcome and Ground Rules

09:20- 09:45 Face-to-face: Share expectations regarding the Workshop

Participants will be expected to introduce themselves to the group and share expectations

09:45- 10:45 Familiarisation and Socialisation with eSkills course content and eTools

Participants will navigate the online and offline environments/resources.

10:45- 11:15 Navigate and discuss content: Module 1 and Module 2 (Fundamentals of eCentre Management)

11:15- 11:30 Tea break

11:30 -12:00 Navigate and discuss content: Module 3 and Module 11 (Services, Marketing and Promotion of eCentres)

12:00-13:15 Engaging in a virtual environment (WebEx)

- Setup WebEx (virtual meeting environment)
- Setup WebEx connection
- Connect to virtual meeting environment
- Setup audio and visual components for presentation purposes
- Do a PowerPoint and Word Document presentation
- Edit a presentation
- Interact (role play)

13:15- 14:00 Lunch

14:00- 14:15 Edit images

Pre-requisites

The **participant is expected** to read Module 3 and 11 on Services, Marketing and Promotion

The **participant is expected** to bring along images of their communities and eCentres.

16:00- 16:30 Online Evaluation: Participants will be expected to post their feedback regarding training session for DAY 1 within an online discussion forum.

DAY 2:

09:00- 09:15 Welcome and highlighting of key concepts

09:15- 09: 35 Navigate and discuss content: Module 9 (eCentre Planning)

09:35- 11:00 Group Activity: Review an existing eCentre business plan and briefly discuss your vision, mission and objectives of your eCentre business plan.

Group Activity: Discuss eCentre training, implementation and marketing services within your eCentre/s.

11:00- 11:15 Tea break

11:15- 11:45 Hands-on training session: Digital Photostory

11:45- 12:30 Create a Digital Photostory: Your eCentre Services

12:30-13:00 Navigate and discuss content: Module 12 (Monitoring and Evaluation of eCentres)

13:00- 14:00 Lunch

14:00-14:30 Group Activity: Discuss how your eCentre services are assessed and monitored.

14:30–15:30 Create a Digital Photostory: Monitoring and evaluation of your eCentre Services

15:30-15:45 Tea Break

15:45-16:30 Online Evaluation: Participants will be expected to post their feedback regarding training session for DAY 2 within an online discussion forum

DAY: 3

09:00- 09:15 Welcome and highlight key concepts

09:15- 10:00 Navigate and discuss: Module 4 and Module 10 (Internet and Computers and Information Management)

10:00- 10:30 Create a tagcloud: Main concepts retrieved in Module 4

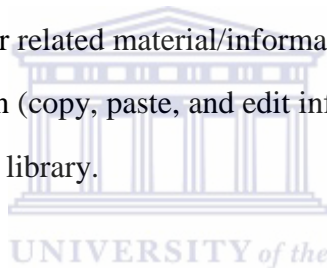
10:30-11:05 Group Activity: Discuss the management of information at your eCentre

11:05-11:20 Tea Break

11:20-13:00 Create an Information Resource Bank for your eCentre

You will be expected to search and identify relevant information (existing ICT courses/resources) that will be of value to your community. To complete the task you will be expected to:

- Browse and search through existing library information/resource bank collated by facilitators;
- Identify a need within own community and search for related information to be added to the existing library:
 - Browse the web for related material/information
 - Update information (copy, paste, and edit information)
 - Insert into existing library.



Demonstrate updates made to central information bank during the session

Individual/Participant will be expected to update the information bank with relevant information regarding specific topics related to his/her community.

13:00-14:00 Lunch

14:00-16:00 Create an eCentre inventory making use of MS Excel (Module 6 &7)

16:00- 16:30 Online evaluation: Participants will be expected to post their feedback regarding training session for DAY 3 within an online discussion forum

DAY 4:

09:00 – 09:15 Welcome and highlighting of key concepts

09:15 – 09:45 Navigate and Discuss: Module 5 eCentre Manager Qualities

09:45 – 13:00 Create a podcast (audio recording) highlighting your qualities as an eCentre Manager

You will be expected to complete the following tasks:

- Prepare a script
- Record your audio
- Import and edit your voice/audio-recording
- Apply effects to voice/audio-recording
- Export the voice/audio-recording (podcast)
- Upload your podcast into online workgroup
- Online peer-review workgroup sessions

13:00- 14:00 Lunch

14:00-15:00 Learn how to download video content

You will be expected to complete the following tasks:

- Download video files and save as different video formats
- Making use of video download list
- Convert multiple video files to one standard video format

15:00- 16:30 Create a narrated PowerPoint (PPT) presentation

You will be expected to complete the following tasks:

- Prepare a storyboard
- Insert text, images files and multimedia
- Add narration and set time period
- Saving narrated PPT presentation as a PPT show
- Testing to ensure the functionality of narrated PPT

DAY 5:

09:00-09:20 Welcome and highlighting of key concepts

09:20- 10:15 Navigate and discuss content: Module 6-8 (Community requirements)

10:15-11:00 Create a Facebook Page for your eCentre

11:00-11:15 Tea break

11:15-14:00 Final presentations: Narrated PowerPoint Presentations

Each participant will be expected to present and reflect on the following aspects of their eCentre:

- eCentre basket of services
- Marketing of eCentre services

- Monitoring and evaluation processes

14:00-14:45 Lunch

14:45-15:00 Prepare for the online phase (4 weeks): What is expected?

15:00-15:30 Online Evaluation: Participants will be expected to post their feedback regarding the face-to-face facilitation week in an online discussion forum.



Appendix E

Additional information

Western Cape statistics

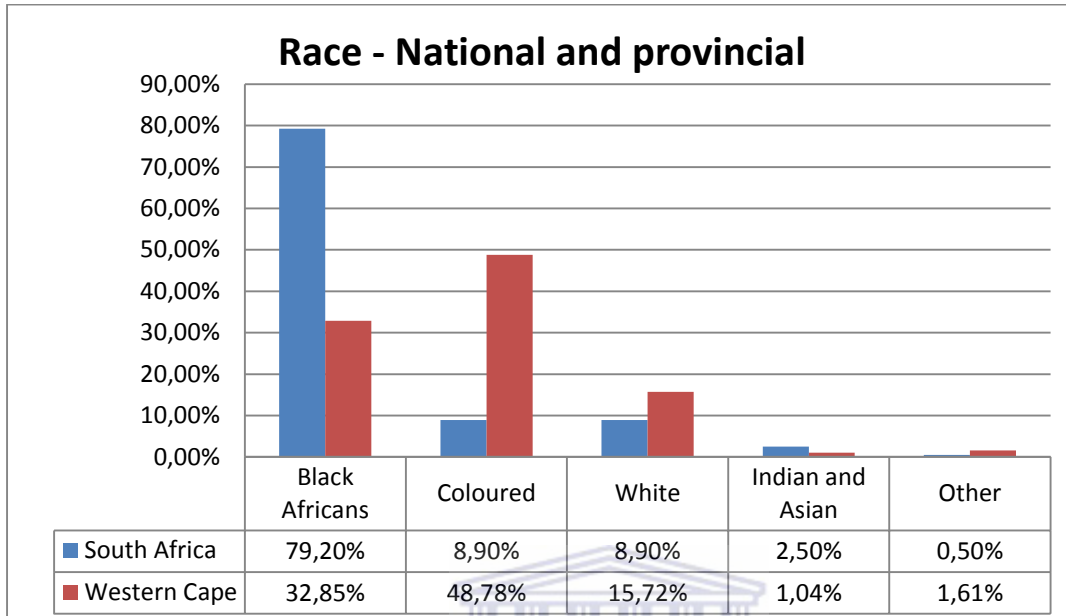


Figure 19: National and provincial racial statistics (Source: Statistics South Africa, Quarter 3, 2013b)

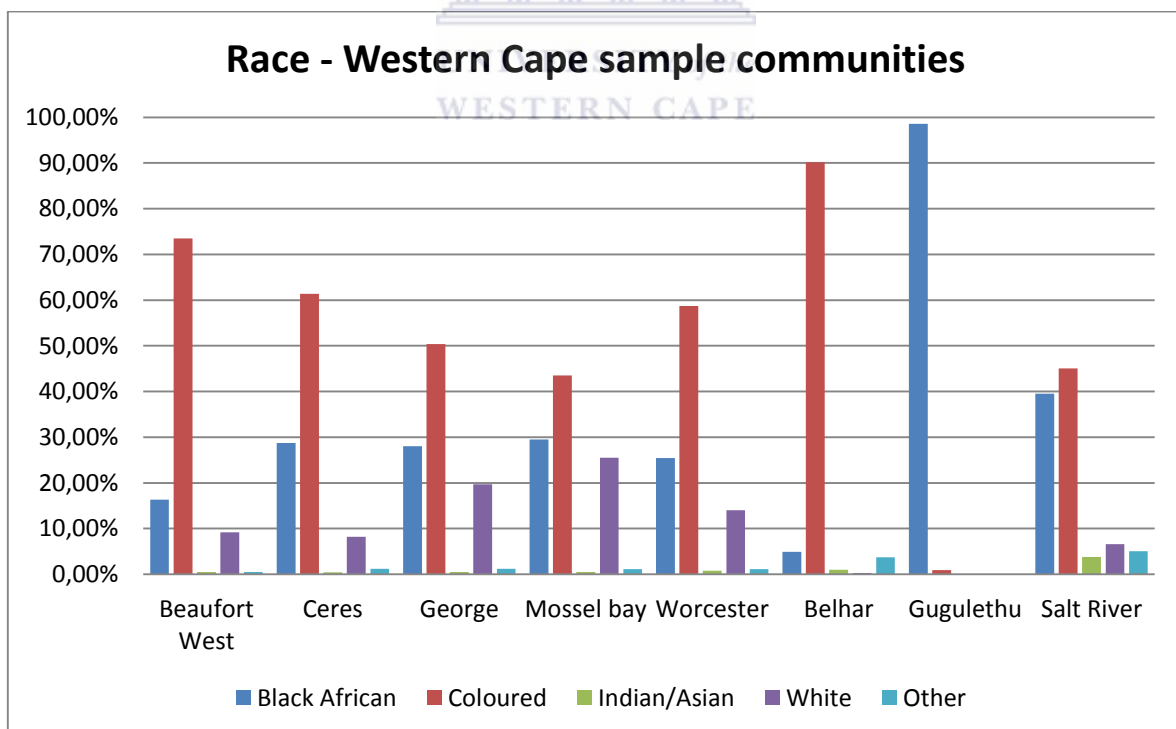


Figure 20: Western Cape communities' racial statistics (Source: Statistics South Africa, 2011)

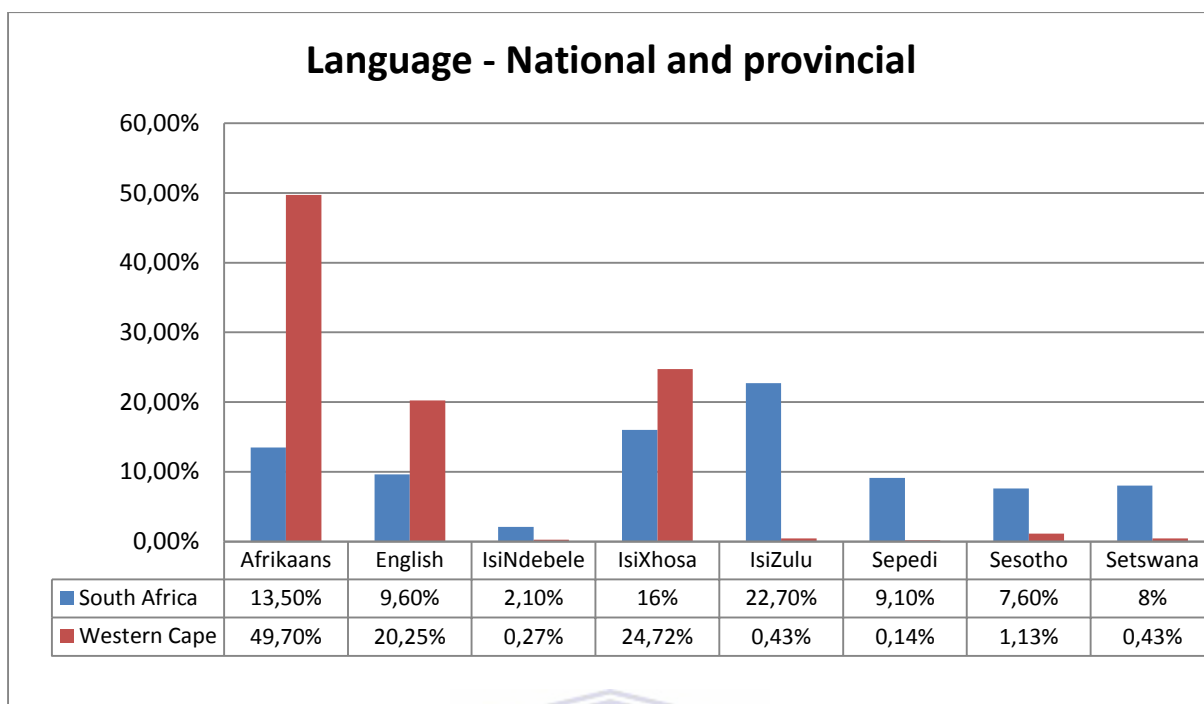


Figure 21: National and provincial language statistics³ (Source: Statistics South Africa, Quarter 3, 2013b)

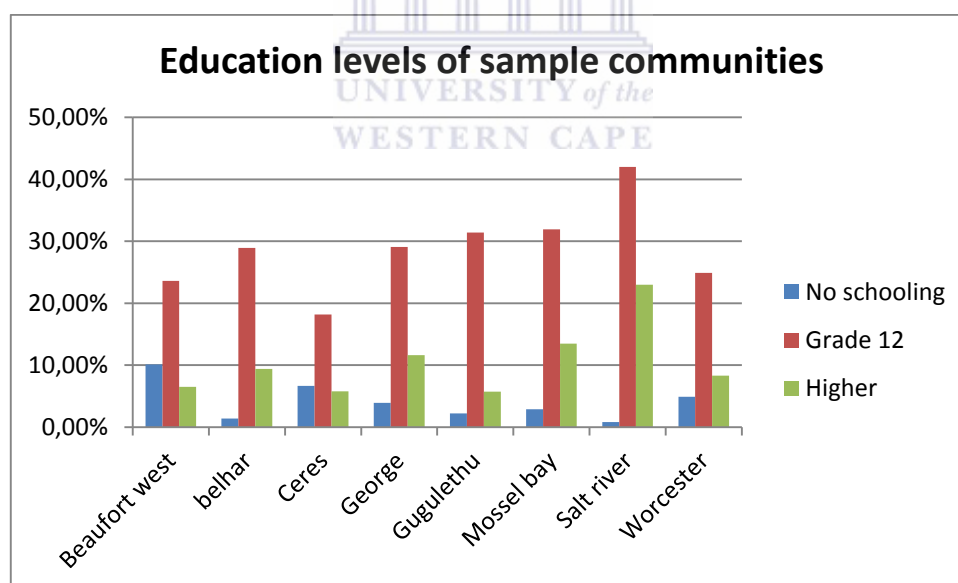


Figure 22: Education level of sample communities (Source: Statistics SA, 2011)

³ Sign language, SiSwati, Tshivenda, Xitsonga and 'Other' languages have been omitted from this chart. Only a small percentage of the population use them in South Africa, with almost no first language speakers in the WC.

ICDL course outline

The International Computer Driving License (ICDL) course provides an example of technological literacy. They offer the following modules according to individual needs and level of advancement:

Table 16: ICDL modules (Source: Chinien & Boutin, 2011)

ICDL

Module 1 Concepts of Information and Communication Technology

Module 2 Using the Computer and Managing Files

Module 3 Word Processing

Module 4 Spreadsheets

Module 5 Using Databases

Module 6 Presentation

Module 7 Web Browsing and Communication

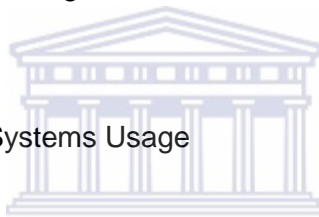
Module 8 2D Computer-Aided Design

Module 9 Image Editing

Module 10 Web Editing

Module 11 Health Information Systems Usage

Module 12 IT Security



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