

University of the Western Cape

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A framework for e-skills policy-making in South Africa



A thesis submitted in fulfilment of the requirements for the Master's degree in
Information Management
In the Faculty of Economic and Management Sciences
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by

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ABSTRACT

The development of the Internet and other information and communication technologies (ICT) in recent decades represents a material foundation for a networked society and the emergence of new economies (Knowledge Society) and is now directly affecting individuals and whole societies. ICT is now an indisputable component of addressing the major issues of equity, sustainability and global competitiveness. Being still in its early developmental phase in many developing countries (such as South Africa), Knowledge Society requires profoundly new ways of thinking, working and living, which includes building of new capacities for the entire nation. These capacities are inter alia inevitably associated with the use of ICT and are often referred to as e-skills. These skills broadly described as the ability to develop and use ICT to adequately participate in an environment increasingly dominated by access to electronically enabled information and a well-developed ability to synthesise this into effective and relevant knowledge.

In order to address a considerable deficiency in e-skills (estimated shortage of 70000 e-skilled people), the South African government through the Department of Communication has established the e-Skills Institute (e-SI) with the mandate to concentrate on the development of adequate skills to allow its citizens to improve their capacities to use all forms of ICT at work, in their education, in their personal lives and in their governance. In this regard, the e-SI is also responsible for creating appropriate policies which should be linked to other relevant national (e.g. Medium Term Strategic Framework (MTSF), 2009 – 2014) and international (e.g. UN Millennium Development Goals - MDGs) developmental strategies. However, while participating in the development of the current national e-skills policy (the National e-Skills Plan of Action – NeSPA¹), the author realised that there were not readily available guidelines or frameworks that could advise policy development in this area. It seems that much space in the policy development is left to the policy-makers own values, experience, expertise, judgement, the influence of lobbyists and pressure groups, pragmatism, or based on the resources available, than on evidence. Thus, this study set the following objectives:

- To understand the theoretical and contextual background of policy-making;

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- To explore existing policy-making frameworks that might be relevant to e-skills policy-making;
- To identify and classify e-skills related elements obtained from pertinent literature;
- To verify these policy-making elements by interviewing experienced policy-makers in the fields of ICT and e-skills;
- To suggest a framework for e-skills policy-making in the South African developmental context; and
- To explain the use of the elements within the proposed e-skills policy-making framework.

These objectives were achieved by reviewing the pertinent literature, which led to the construction of the conceptual model for e-skills policy-making in South Africa. This model consists of eight elements: (i) Context-related awareness, (ii) Collaborative e-skills ecology, (iii) Excellence education for all, (iv) Futures of ICT capabilities and knowledge infrastructure, (v) Research and development, (vi) Cost and affordability, (vii) E-inclusion and (viii) Monitoring and evaluation. This model was subsequently empirically tested using the Interpretive Hermeneutic research approach by interviewing a number of policy-makers in the fields of e-skills or broader field of ICT policy-making. The empirical findings confirmed validity of the above e-skills policy-making elements but also elicited two new elements: (ix) Integration and systemic approach and (x) Aggregation. Consequently, these elements were assembled together into a framework for e-skills policy-making in South Africa. In order to make the proposed e-skills policy-making framework operational, the next step of this study was to relate this framework to the policy-making processes. This was done by positioning elements of e-skills policy-making framework within the EU “Policy making 3.0” process model.

The main contribution of this study is seen in the fact that it brings a novel e-skills policy-making framework particularly design for the South African context but keeping in mind that it can possibly be used in other similar developing countries. Theoretically, this study has added to the academic understanding of significance of certain concepts for e-skills policy-making derived from the pertinent literature but

also those identified empirically by this research. Now this study can be used for a practical implementation and also as a base for further academic research.

This study also has some limitations mainly seen through a fairly small research sample caused by absence or unavailability of experienced policy-makers. However, it is believed that this limitation did not limit validity of results and the practical and academic contribution of this study.

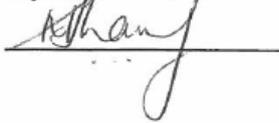
Keywords: ICT, e-Skills, South Africa, policy-making, framework, developmental state.



DECLARATION

I declare that “**A framework for e-skills policy-making in South Africa**” 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.

Mymoena Sharif



Date

13 August 2013



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CHAPTER 1: INTRODUCTION

1.1 Background of research problem

The development of the Internet and other information and communication technologies (ICT) in recent decades represents a material foundation for a networked society and the emergence of new economies (Knowledge Society) and is now directly affecting individuals and whole societies. ICT is now an indisputable component of addressing the major issues of equity, sustainability and global competitiveness. Being still in its early developmental phase in many developing countries (such as South Africa), Knowledge Society requires profoundly new ways of thinking, working and living, which includes building of new capacities for the entire nation. These capacities are inter alia inevitably associated with use of ICT and are often referred to as e-skills (Mitrovic, 2010). These skills broadly described as the ability to develop and use ICT to adequately participate in an environment increasingly dominated by access to electronically enabled information and a well-developed ability to synthesise this into effective and relevant knowledge. This knowledge is particularly important in developing countries as it is a base to achieve sustainable-development goals (IDRC, 2008).

In order to address a considerable deficiency in e-skills (estimated shortage of 70.000 e-skilled people), the South African government through the Department of Communication has established the e-Skills Institute (e-SI) with the mandate to concentrate on the development of adequate skills to allow its citizens to improve their capacities to use all forms of ICT at work, in their education, in their personal lives and in their governance. In this regard, the e-SI is also responsible for creating appropriate policies which should be linked to other relevant national (e.g. Medium Term Strategic Framework (MTSF), 2009 – 2014) and international (e.g. UN Millennium Development Goals - MDGs) developmental strategies. However, while participating in the development of the current national e-skills policy (the National e-Skills Plan of Action – NeSPA²), the author realised that there were not readily available guidelines or frameworks that could advise policy development in this area. It seems that much space in the policy development is left to the policy-makers own

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values, experience, expertise, judgement, the influence of lobbyists and pressure groups, pragmatism, or based on the resources available, than on evidence (Young & Mendizabal, 2009).

1.2 Statement of research problem

As the above-described practice of policy-making, only weakly informed by research-based evidence, is considered as insufficient (Bird et al., 2004), the South African e-skills agenda (being still new) needed an appropriate foundation for decision-making. That foundation is seen as evidence-based policy-making (Mitrovic, 2010) - which is still to be developed in the context of the developing countries such as South Africa.

1.3 Research question and sub-questions

The identified research problem suggested that answering the following main question would lead to a framework for e-skills policy-making in South Africa:

What are the elements of the national e-skills related to policy-making framework and how can this framework be effectively implemented?

To breakdown the complexity of the main research questions, (at least) the following sub-questions were asked:

- What is the theoretical and contextual background of policy-making?
- Are there existing policy-making frameworks that might be relevant to e-skills policy-making in South Africa?
- If there is no suitable e-skills framework, what are elements of e-skills policy-making framework relevant in the South African context?
- How should these elements be used in the policy-making process?

1.4 Research objectives

The main objectives of this study can be defined as:

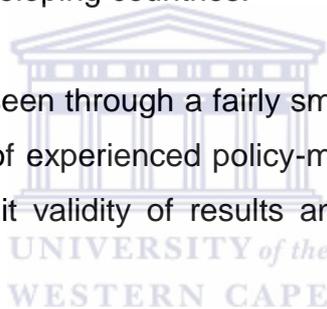
- To understand the theoretical and contextual background of policy-making.
- To explore existing policy-making frameworks that might be relevant to e-skills policy-making.
- To identify and classify e-skills related elements obtained from pertinent literature.

- To verify these policy-making elements by interviewing experienced policy-makers in the fields of ICT and e-skills.
- To suggest a framework for e-skills policy-making in the South African developmental context; and
- To explain use of the elements within the proposed e-skills policy-making framework.

1.5 The scope and limitations of the study

This study was concocted in a specific South African context – a context of a developing country, which adopted a paradigm of so called “developmental state” (increased involvement of the government in addressing actual socio-economic issues). This approach inevitably limited generalisation of the study’s findings. It is, however, hoped that the results of this research could be (to a certain extent) significant for other similar developing countries.

There is also some limitation seen through a fairly small research sample caused by the absence or unavailability of experienced policy-makers. However, it is believed that this limitation did not limit validity of results and the practical and academic contribution of this study.



1.6 Research methodology

From the philosophical perspective this research belongs to the large group of qualitative methods since the data is obtained by interviewing the policy-making and e-skills experts and the data analysis is done using the hermeneutics mode of analysis. Based on the underlying epistemology, this study has utilised the interpretive method that allowed the participants in this study to “*just as much as the researcher, can be seen as interpreters and analysts*” (Klein & Myers, 1999).

In its essence this study has utilised ***Interpretive Hermeneutics***, which application shows in the data analysis that was performed by movement of understanding from the whole (the context in which policy-making takes place and the underlining policy-making principles) to the parts (the details of the policy-making framework) and back to the whole (Gadamer, 1976; in Klein & Myers, 1999). The research sample consisted of 10 interviews. The sample consists of high-level policy-makers from

government, academia and the corporate world but also from the “closer to ground” policy-maker researchers from the parliamentary political parties and Not-for-Profit Organisations (NPOs).

Interpretivism suggests that facts are produced as part and parcel of the social interaction of the researchers with the participants. Whereas the principle of contextualization places the object of study in context, the principle of interaction between the researchers and the subjects requires the researcher to place him or her and the subjects into a historical perspective (Klein; Myers, 1999).

After carefully assessing the nature of this study and the available research techniques, the following were applied in this study:

- The **review** of the pertinent **literature**;
- **Interviews** that involved the recording of verbal data from interviewees, which arises in relatively unstructured interviews;
- **Descriptive/interpretive** techniques that include self-examination of the researcher's own pre-suppositions and prejudice, and cycles of additional data collection and analysis. This approach is used for interpretation of the interviews.

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In order to secure credibility of this research, the author has adopted the Klein and Myers (1999) evaluation criteria for the interpretive field research.

1.7 Ethical consideration

Scientific research invariably involves studying beings in some form or another. Where research involves the acquisition of material and information provided on the basis of mutual trust, it is essential to protect the rights, interest and sensitivities of those who participated in this study. These are:

- The right to privacy (including the right to refuse to participate in research);
- The right to anonymity and confidentiality: No users' names and/or details will be mentioned in this research;
- The right to full disclosure about the research (informed consent);
- The right not to be harmed in any manner (physically, psychologically or emotionally);

It is hereby confirmed and agreed that the researcher undertook to adhere to the above and in addition that no data and information that was gathered for this research project will be used outside of the University of the Western Cape nor will it be used for anything other than research purposes.

1.8 Findings in brief

The literature review showed that there is no e-skills policy-making framework that can be adapted and used in the South African context but has elicited a number of models and theories useful to extract elements for such a framework. Indeed, the relevant literature helped in identifying eight elements relevant to e-skills policy-making: (i) Context-related awareness, (ii) Collaborative e-skills ecology, (iii) Excellence education for all, (iv) Futures of ICT capabilities and knowledge infrastructure, (v) Research and development, (vi) Cost and affordability, (vii) E-inclusion and (viii) Monitoring and evaluation. The empirical findings confirmed validity of the above e-skills policy-making elements but also elicited two new elements: (ix) Integration and systemic approach and (x) Aggregation. Further analysis of these elements suggested that they can be grouped in three big groups:

- *Thematic*: E-inclusion, Cost and affordability, Research and development, Monitoring and evaluation;
- *Systemic*: Integration and systemic approach, Aggregation, Excellence education for all, Futures of ICT capabilities and knowledge infrastructure; and
- *Contextual*: Context-related awareness, Collaborative e-skills ecology.

Thus, these three groups with their elements construct a finally proposed e-skills policy-making framework in South Africa. In order to make it operational, the elements of the proposed e-skills policy-making framework were positioned within a policy-making processes model (Policy making 3.0). It also briefly explained the role of these framework elements in the process of policy-making.

1.9 Contribution of this study

The main contribution of this study is seen in the fact that it brings a novel e-skills policy-making framework particularly design for the South African context but in mind that it can possibly be used in other similar developing countries. Theoretically, this study has added to the academic understanding of significance of certain concepts

for e-skills policy-making derived from the pertinent literature but also of these identified empirically by this research.

1.10 Chapter Outline

This thesis is further structured in the following way:

Chapter 2: *Literature review*, which encompasses three main sections: Process in policy-making, e-Skills conceptual landscape, and e-Skills policy framework in South Africa: a conceptual proposal.

Chapter 3: *Research design and methodology*, which consists of the following main sections: Semantic clarification of research terms, Philosophical perspective, Selected methodology, Research techniques of choice, and Research design.

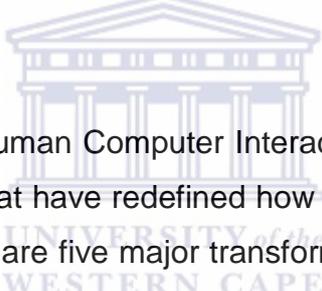
Chapter 4: *Empirical findings*, which consist of the following main sections: General findings, Relevance of the conceptual framework derived from the literature, New conceptual elements, Proposed e-Skills Policy-making Framework in South Africa, and Proposed fitting into the policy-making processes.

Chapter 5: *Conclusion and recommendations*, which consist of the following main sections: Conclusion, Recommendations, Contribution of this study, and Limitations of this study.

The thesis concludes with a list of References and a number of relevant Appendices. See pages 116 -137.

CHAPTER 2: LITERATURE REVIEW

It is widely accepted that ICT is becoming rapidly pervasive throughout every part of our daily life, yet how we take full advantage thereof should be guided by human social values to motivate appropriation of these technologies. The question what makes us human or why we behave the way we do, or in broader societal terms, why do some societies excel while others are slow to take off, are potential queries that policy-makers must seek to understand. The fact that ICT use and the related socio-economic transformations become more non-linear and network-driven, and being more human-needs (values) driven, suggests that a set of human social values can articulate the shaping of ICT policy-making. In the context of this study, it is suggested that a framework for e-skills policy should be sensitive to those human social values that impact people behaviour or even modification to behaviour patterns.



From the perspective of the Human Computer Interaction (HCI) paradigm, there are some major transformations that have redefined how we relate to technology. Sellen et al. (2009) believe that there are five major transformations: (i) *the end of interface stability*, (ii) *the growth of techno-dependency*, (iii) *the growth in hyperconnectivity*, (iv) *the end of the ephemeral*, and (v) *the growth of creative engagement*.

The **first transformation**, i.e. *the end of interface stability*, deals with the many interfaces that pervade our environment: from within malls, toys, airports, private spaces of homes and offices, as well as that we carry them, wear them and even have them implanted within us. A **second transformation**, i.e. the *growth of techno-dependency*, refers to the reliance we have placed on computers (of any kind, including mobile phones) to underpin almost every area of our life. A **third transformation**, i.e. the *growth in hyperconnectivity*, describes how ICT, despite its ability to improve efficiency, also consumes our time as we are tied together one to the other more than ever before. The **fourth transformation**, i.e. the *end of the ephemeral*, relates to how we create and ever-increasing so called “digital footprint” about every person or entity about which data is captured and stored in various electronic databases. The **fifth transformation**, i.e. the *growth of creative*

engagement (such as Web.2.0), allow us the flexibility to use tools to express ourselves in new ways (e.g. social media, blogs, podcasts). Having in mind these wide set of issues now at play, Sellen et al. (2009) suggest that “*HCI...take into account the truly human element, conceptualizing ‘users’ as embodied individuals who have desires and concerns and who function within a social, economic and political ecology*”.

As ICT research and design takes increasing account of human values, the role of policy-makers in ICT become more collaborative through interdisciplinary exchange. This practice is notably confirmed in the South African e-skills context in which the multi-stakeholders collaboration is one of the cornerstones of success (NeSPA, 2010). The South African National e-Skills Plan of Action (NeSPA, 2010) is built on the believe that this collaborative relationship significantly influence policy creation as newer pathways to transcend collaborative differences need to be adopted in order to bring together the features of human and ICT elements in a coherent ICT-related policies. These policies, particular skills-related ones, should be developed from a human values, or perhaps more broadly, from a human social values perspective. In this regard, Foley et al. (2002) refers to a user focused perspective: since ICT have ubiquitous influence, people must be skilled to understand the flow and impact of this influence on human development. In essence people need: (i) to be skilled in understanding the ubiquity and impact of ICT across all human life, (ii) understand and know the need or reason why to acquire appropriate ICT skills, and (iii) to have a basic value perception what the acquiring of ICT skills will mean on managing or determining the direction on their human development.

2.1 Process in policy-making

A policy is often described as a purposeful plan, which aim is to guide decision-making and achieving an intended outcome. It is, however, believed that such a plan of action should be informed by the relevant evidence as such an approach, by linking research, policy and practice, can help in building an adequate framework (RAPID, 2010 as found in Mitrovic, 2010) - for the e-skills policy-making in this case. The problem is, as the published studies suggest, that many policy processes are only weakly informed by research-based evidence. Bird et al. (2004) believe that only 2 of 25 examined policies were the research-based. They stated that the

knowledge gained by research is often isolated from the policy-makers and practitioners in the field - instead to be used for informing policies. This was the reason for Hearn & White (2009) to call for more effective bridges between knowledge, policy and practice.

The understanding of these linkages between researchers, policy-makers and practitioners can have practical implications in assisting in the policy-making processes. For example, the execution of Medium Term Strategic Framework (MTSF) 2009 - 2014, which stipulated that *“the national government’s mandate underscores the need to create a nation united in diversity, working together to weave the threads that will result in the creation of a democratic, non-racial, non-sexist and prosperous society”* (MTSF, 2009) would not be possible without an understanding of **how** *“to create a nation united in diversity”*– supported by an adequate policy-creation, in the case of this research.

The policies in this area were needed as the attainment of e-skills (for any purpose) should not be sporadic but, instead, be based on a methodological approach (EESF, 2004). An example of the methodological approach, based on the knowledge gained in the policy-making oriented research, was given by linking the ICT and e-skills supported social cohesion with the philosophy on which idea of social cohesion in South Africa is built upon - the philosophy of Ubuntu, which some authors also consider as a public policy (Mitrovic, 2010). Mitrovic (2010) believes that the policy creation should be based on both: (i) internationally recognised e-skills frameworks, such as the Skills for the Information Age (SFIA, 2008) or the European e-Competences Framework (UGe-CF, 2008), and (ii) on the local (SA) research in this area that adds new value (e.g. clarification of still “grey areas” or augmentation to the existing thinking in e-skills area). A framework resulting from that kind of approach could be useful not only in the South African context but could possibly be replicated in other (similar) developing countries.

In order to better understand the policy-making processes, this section brings discussion regarding the ICT policy framework in South Africa, the role of theory and research in policy-making, and the usefulness of evidence-based research in policy-making.

2.1.1 Role of theory and research in policy-making

This section serves the purpose to discuss and explain, firstly, the linkages of theory and policy and, secondly, relations between research and policy-making.

2.1.1.1 Theory and policy

Policy decisions are influenced by knowledge in the following ways: (i) factual knowledge, (ii) rules of thumb, (iii) typologies, and (iv) empirical laws (Walt, 2005). However, making policy decisions can also be done using theories. Walt (2005) describes theory as a “*causal explanation*” as “*it identifies recurring relations between two or more phenomena and explains why that relationship is*”. In that sense, Walt (2005) believes that theory can assist policy-makers in at least four ways: *diagnosis, prediction, prescription and/or evaluation*:

- **Diagnosis:** As the policy-makers face a huge amount of information, theory helps to sort out this vast information field by providing a set of possible interpretations for drawing possible diagnostic scenarios. Once diagnosis is made, theory may guide the search for additional information until most relevant information is obtained.
- **Prediction:** Theories can help policy-makers in anticipating outcomes or events since good theories are able to identify central causal factors so that the policy-makers can have a better understanding of the broader context of the phenomenon they face.
- **Prescription:** Theory guide policy decisions in the following ways: help policy-makers to evaluate both desirability and feasibility of objectives. It can also assist policy-makers to understand what needs to be done to achieve a particular result and to identify the conditions where policy instruments are best possible to work. The ability to ascertain causal chain between action and results can help policy-makers to anticipate success or failure of their policies.
- **Evaluation:** Theory provides the crucial link in evaluating policy decisions. Theory helps with identifying benchmarks by which policy-makers can measure whether a policy will fail or succeed.

A useful theory that can be used in understanding how antecedents may play an important role in the building of e-skills policy is the Theory of planned behaviour by Fishbein and Ajzen (1980, cited in Siragusa & Dixon, 2008) (see Figure 1). Studies (e.g. Siragusa & Dixon, 2008) have shown that the application of Fishbein and Ajzen’s theory provide valuable understanding around antecedents of attitudes, subjective norms, and behavioural control. They show that these antecedents determine intentions and actions. In understanding the antecedents that drive intention and action, an e-skills policy will be clearer on the intended outcomes or objectives it wish to attain and how they will be realized.

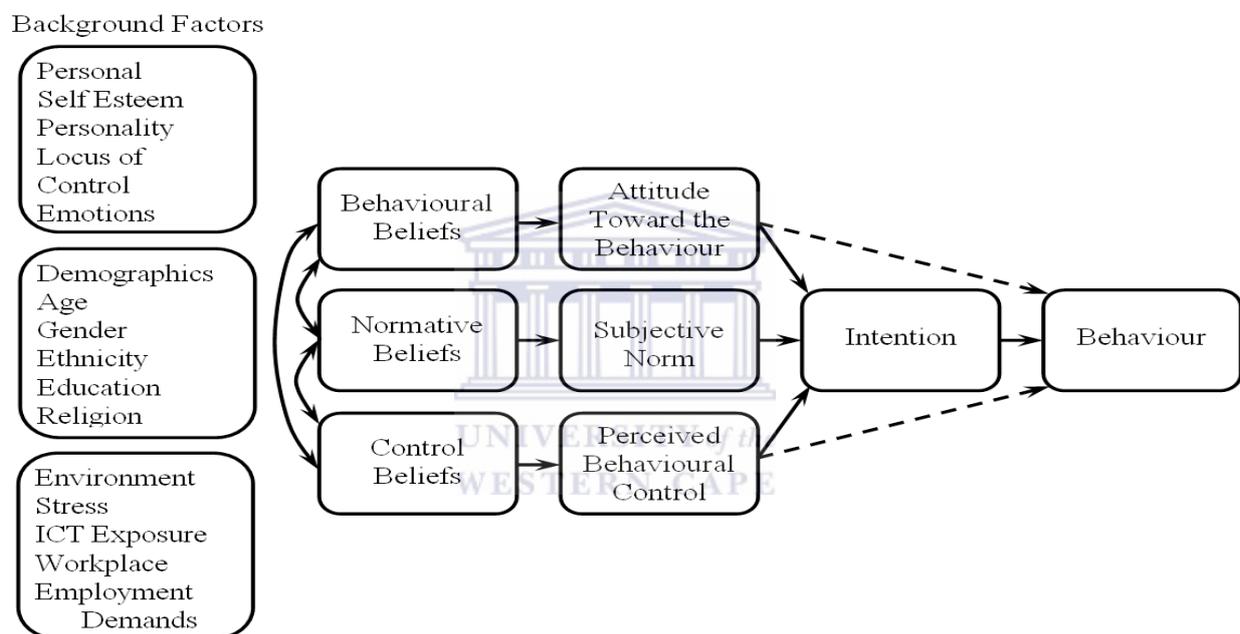


Figure 1: Theory of planned behaviour (Source: Fishbein & Ajzen, 1980)

2.1.2 Research and policy

A number of authors (e.g. Girard & Lara (2012; Young & Mendizabal, 2009) believe that the development of policy is a complex process, despite given the best proposals backed by solid research, failure to adopt or acknowledge usefulness of research findings is still prevalent. The reasons are plentiful ranging from conflicting demand pressures on decision-makers, exacerbated by contradictory evidence, creating difficulties for studies from independent research to be considered. Even if independent research findings are accepted, this does not mean that these will be introduced into policy debates. Other complexities include when there is no shared common agenda between researchers and policy-makers as it usually “resulting in

carefully researched solutions that policy-makers are not trying to address". Botto (2009, cited in Girard & Lara, 2012) highlights two paradigms that inform how research results have an influence on policy-making in Latin America, which is a developing region like South Africa. The first paradigm describes a rationalist and linear approach whereby researchers have to work within clearly-defined parameters to produce knowledge and offer solutions based on empirical findings and upon which policy-makers are charged with implementing such solutions. The second paradigm describes a more complex relationship of the roles played by other actors and external factors, and *"that there is not 'one' but 'multiple' decision-making arenas that are juxtaposed and self-regulated through a mutual adjustment. Various actors, with partial information and diverse knowledge, participate in this decision-making process"*.

The South African government has also experienced the complexity in policy-making. For example, in the presentation *Barriers and Solutions that impact policy (South African government experience)*³, the following barriers that influence effective policy-making are highlighted:

- "Running to stay still": **Time pressure** from 'above'" (passed on often without explaining the implications & risks) based on urgency & scale of problems & issues – almost unanimous from Director General onwards.
- **Mistrust** between political leadership, officials and experts.
- **Politicisation**: officials "playing politics", "I am a pragmatist, providing the 2nd best policy option when the best option will not be welcome".
- **Lack of clear requirements** for policy development & review linked to effective planning, M&E systems that build evidence & better understanding.
- **Policy silos** – focus us on 'deliverables', not outcomes & impact.
- Policy decisions not based on analysis of **needs / based on objective facts**.
- **Exclusion**: Too little input from & building shared understanding & common cause with beneficiaries, the target group, the implementation system.

³The South African (S.A.) Presidency Survey (2012) Power Point presentation

- **Capacity:** Research literacy & policy analysis not required competencies.
- **Inadequate institutionalised respect** for expertise, open peer review.
- **Hierarchy** makes it difficult to engage robustly & prevents access for middle management, service providers and implementers.

In response on how to overcome these barriers listed above, the S.A Presidency (2012) survey, among government officials responded as follows (PowerPoint presentation):

- Officials overwhelmingly felt that **strengthening the use of evidence** should be prioritised.
- Differences related to the “predictive” or “formative” view that influenced thinking about **what forms of evidence should be prioritised**.
- Overwhelming support for improving evidence derived from more formal and scientific methods, including research syntheses of the systematic review type.
- But the majority feeling was that these have limited applicability given the complexity and dynamism of the majority of policy contexts in South Africa. For this reason, many officials stressed the need to improve **substantive evidence derived from monitoring and evaluation** so that this can be used formatively, over time to adapt and improve policy.
- There was an almost unanimous view that the **whole policy cycle** needs to be strengthened, including the links between stages and the capacity to identify, acquire and use the information required for effective decision-making at each stage. ‘Evidence’ from evaluation should particularly be improved by building an evaluation framework at the formulation and design phases.
- Most, but particularly the formative group, stressed the need to **improve the inclusion of a range of key stakeholders** as a condition for ensuring improved relevance of policy decisions to needs and to the operational context.
- The ‘predictively’ orientated group felt that there needed to be more **formally enforced requirements** for use of evidence as well as more consistent **consequences** for poor policy decisions and/or poor performance. Expertise

tended to be emphasised, somewhat at the expense of a recognition of political or value driven decisions. A major concern was to put in place mechanisms that would avoid policy failure as far as possible from the outset so as to avoid a waste of resources.

The above discussion points out that decision-makers are largely aware of the usefulness of evidence-based policy-making though they do not necessarily base their work on this premise.

2.1.3 Usefulness of evidence-based research in policy-making

There is widespread acceptance in government for evidence-based research to inform policy, including support by the e-Skills Institute and the Department of Communications South Africa to integrate evidence data to e-skills policy-making. Young & Mendizabal (2009) argue that six lessons have been identified for researchers wishing to embark on evidence-based policy change. The **first** lesson is that policy processes are complex and rarely linear or logical, and to simply present information to policy-makers will hardly move them to act. The **second** lesson is that many policy processes are only weakly informed by researched-based evidence. **Third**, research-based evidence can strengthen policies to have a dramatic impact on lives. The **fourth** lesson is that policy entrepreneurs need to have a holistic understanding of the context they work in. **Fifthly**, policy entrepreneurs need additional skills if they wish to influence policy. They need to be political skilful or ***politically astute***. This fact has prompted the e-Skills Institute to introduce a term e-Social Astuteness, which designate the astuteness not only in the domain of the policy-making but also in the realm of utilising e-skills in the social or economic context⁴. **Sixth**, since policy-making is not an easy process, policy entrepreneurs must be clear in their intent that they want to do it.

Based on the lessons highlighted above, Young & Mendizabal (2009) have provided an eight-step approach that can assist in the making of policies. The eight-step approach is known as the RAPID Outcome Mapping Approach (ROMA):

⁴ The concept of e-Social Astuteness was also accepted by the delegates of the 2nd e-Skills Summit and The ITU Global ICT Forum on Human Capital Development, held in Cape Town, October 2012

- The **first step** in the ROMA approach is to ***define a clear, overarching policy objective***.
- Following this, the **second step** is to ***map the policy context***, and to ***identify key elements*** that may influence the policy process. For example who are the key actors, what is their agenda and what influence may they have on the political context. With reference to the political context, it is important to know if there is political change, is there room for manoeuvre, or what problems are perceived by the policy-makers.
- Once these and other issues have been satisfactorily covered, the **third step** is to ***identify the key influential stakeholders***. This can be done along three dimensions: *“the degree of alignment (i.e. agreement) with the proposed policy, their level of interest in the issue, and their ability to exert influence on the policy process”*.
- Following this, the **fourth step** refers to ***developing a theory of change***. The idea is to focus on those stakeholders who are most likely to be targeted to influence policy change and to attain desired policy objectives.
- To support this, the **fifth step** is to ***develop a strategy*** in order to ***achieve the proposed changes*** in the process. For example, the strategy will mark out ways to deal with those forces who can influence change or those who resist change. This means targeting priority stakeholders of influence.
- The **sixth step** is to ***ensure the engagement team has the competencies*** required to operationalise the strategy.
- Once all information has been gathered up to that point, the policy-making can move to the **seventh step** that refers to ***establishing an action plan*** to meet the desired objectives. This final (eight) step also includes developing a ***monitoring and learning system***.

However, the reviewed literature also shows opposite approaches. For example, Du Toit (2012) argues that although the scientific based evidence seems an unquestionable approach, the assertions about evidence and science are dubious, and there is no reliable guide to the challenges involved. Du Toit (2012) further argues that the Evidence Based Policymaking (EBP) is normative that has originated out of New Labour’s (UK) ideological and political roots with a distinctly technocratic

nature. He cites Sanderson (2002) who portrays EBP as concerned purely with instrumental rationality. Additionally, according to these authors, the assumption is that EBP can determine between the impact and results of policy alternatives simply on impartial, objective and rational assessment of evidence. A further assumption is that “experts” should play a central role in attaining evidence, analyse it and communicate implications to policy-makers. Besides criticism that EBP is elitist and antidemocratic, another concern of Du Toit (2012) is the “exporting” of EBP beyond the context of its genesis. He is of the view that EBP offers an understanding of evidence that can best be described as naive empiricism: *“it assumes that understanding social reality is in the first place a matter of understanding the evidence; that the clarity, adequacy and accuracy of this understanding depends primarily on having enough (or the right) evidence...and that social policy is ultimately a matter of scientists...presenting and communicating what the evidence ‘says’ as clearly and unambiguously as possible”*. To assume that EBP supersedes the influence of ideology, politics or guesswork is an exaggeration. In fact politics and ideology provide the policy narratives in which policies are debated, and as such these narratives become a part in the politics of evidence. It is in this respect that a more adequate understanding of the role of “evidence” is called for in the policy process (Du Toit, 2012). However, according to South African Presidency (2012) evidence-based research has a significant influence on policy (see graphic display in Figure 2).

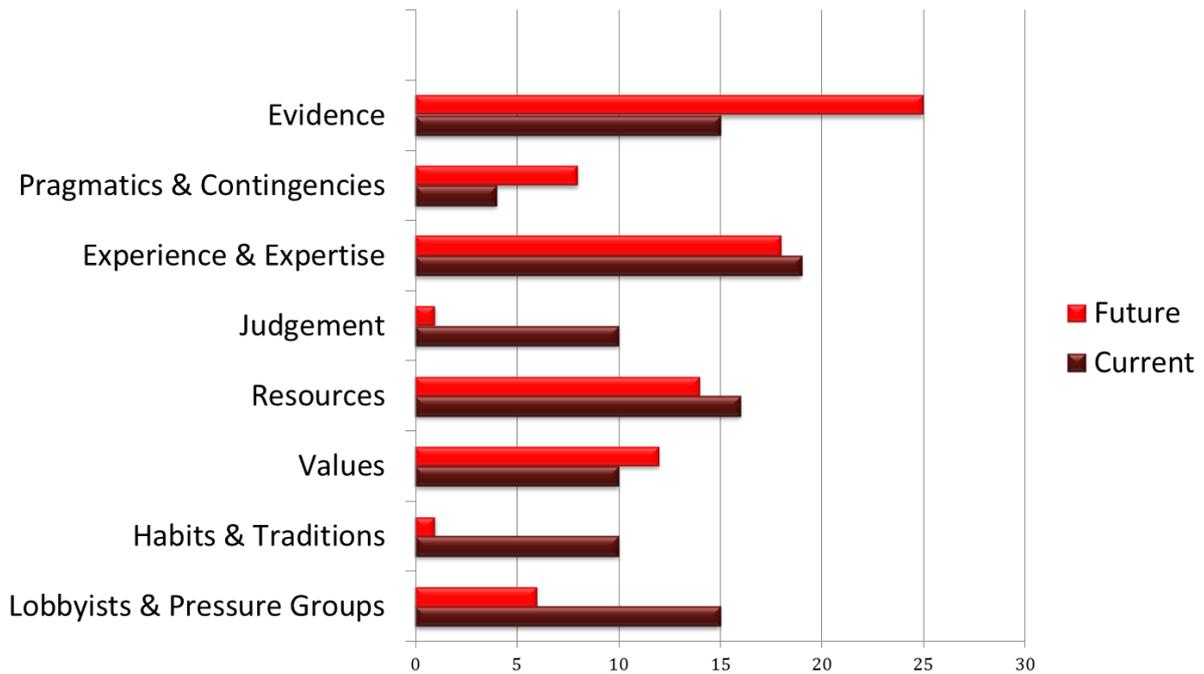


Figure 2: The main factors that influence policy (Source: South African Presidency, 2012)

The two opposite opinions found in the reviewed literature provoke a question of whether e-skills policy should be evidence based. According to Du Toit's (2012), it seems that two issues are of his major concerns: (i) how do policy narratives shape evidence-based approach and (ii) what context specific influences are key to define policy. The next sections bring discussion regarding these concerns linked to the e-skills policy-making in South Africa.

2.1.4 Policy-making processes: the contemporary thinking

As shown the above (and also will be shown in the subsequent sections) the contemporary policy-making thinking includes two main elements: participatory approach and evidence-based model. One of relevant process model of policy-making is the European Union model "Policy making 3.0" (DAE, 2013). This model (Figure 3) is currently being used by the European Commission to inform future strategic choices related to ICT.

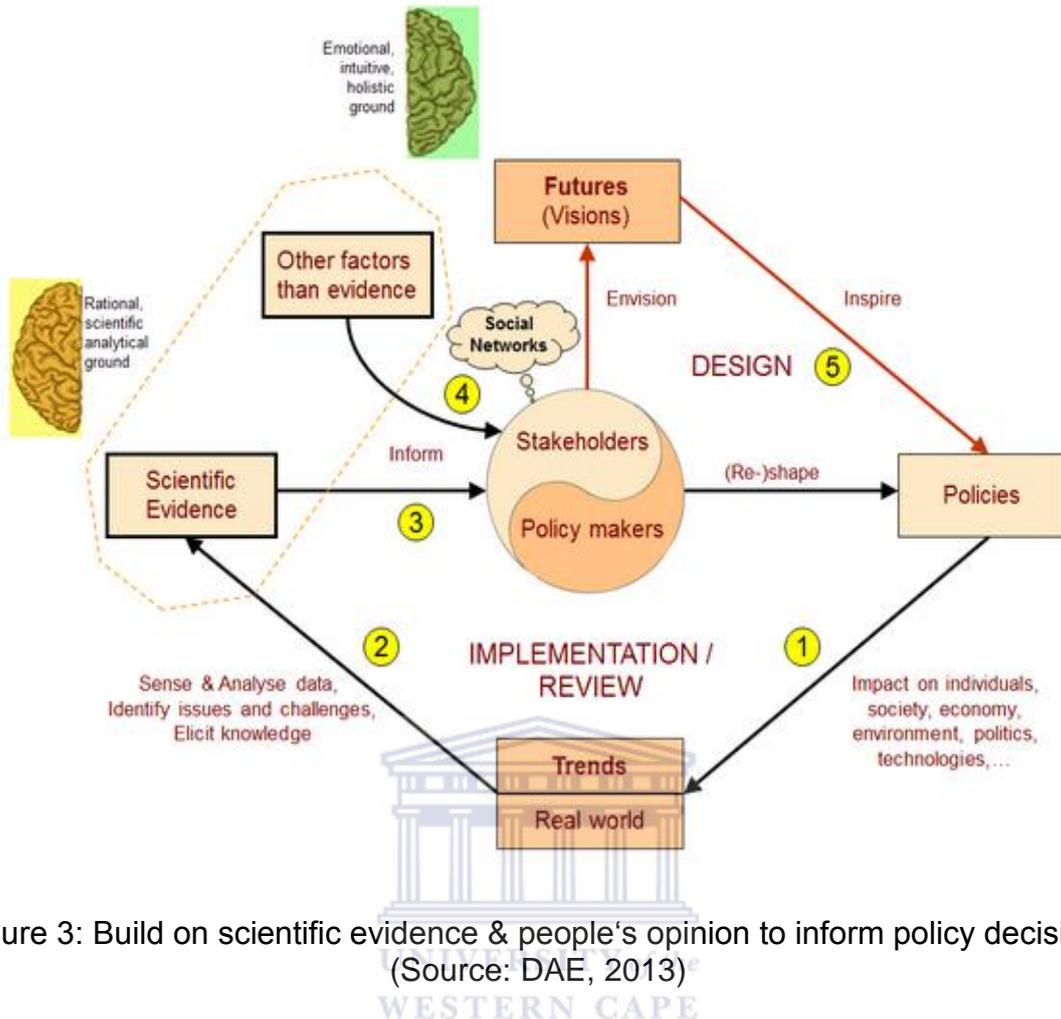


Figure 3: Build on scientific evidence & people’s opinion to inform policy decisions (Source: DAE, 2013)

The Policy making 3.0 is based on the emergent collective intelligence and the social between the social network consisting of stakeholders and policy-makers. This policy co-design is based on of two distinct factors: (i) **scientific evidence** stemming from the *collective wisdom* of stakeholders and policy-makers, and (ii) **sentiment** stemming from the *collective aspirations* of stakeholders and policy-makers, and measurable through the social network. As explained by DAE (2013): “most neuroscientists recognise the above concepts as primitive mechanisms that determine the actions and reactions of individuals” but the Policy making 3.0 model “scales up the metaphor of the ‘left and right brains’ to the social network to make current policy-making processes more participatory, transparent and agile”.

The essential elements of the Policy Making 3.0 process are explained as follow DAE (2013):

1. *The implementation of policies co-developed by policy-makers and stakeholders has an impact on the real world (individuals, society, economy, environment,...).*
2. *The real world is sensed and data are gathered, measured and analysed through knowledge mining and statistical tools, which allows to identify trends, issues and challenges and to elicit scientific evidence.*
3. *The scientific evidence gives ground to stakeholders and policy-makers to re-shape policies.*
4. *Stakeholders and policy-makers interact in social networks where other factors than evidence emerge, such as personal opinions, corporative interest, lobbying, ideological values and other 'non- measurable' factors (i.e. that cannot be easily sensed and captured automatically). Such factors often prevail on the scientific evidence.*
5. *Policies may also be inspired by desirable visions and aspirations that are not necessarily in line with current, short term trends and can also be considered as part of the 'emotional' and intuitive factors that influence decisions.*

Compared to other policy-making process models shown in this literature review chapter, the Policy making 3.0 is the closest to the topic of this research as it refers to the ICT policy-making processes, which is directly relevant to ICT-based skills, i.e. e-skills. Hence, this model will later on be used for positioning the e-skills policy-making framework identified by this study: both theoretically and empirically.

2.2 E-skills conceptual landscape

The reviewed literature suggests that the e-skills landscape is best understood if it is explored from its various facets. Thus, the discussion regarding e-skills landscape in this document will continue by portraying the background to the e-skills agenda in South Africa, definitions of e-skills, the role of the notion of E-inclusion as the foundation of e-skills policy framework, followed by discussion on the rationale, benefits and impact of e-skills on society. The e-skills shortages and challenges, social user context (environment), collaborative e-skills ecology, excellence education for all, and the future oriented perspective to guide e-skills preparedness and development are also given in this main section.

2.2.1 Background to e-skills agenda in South Africa

The origins for establishing an e-skills agenda in South Africa stemmed from a number of assumptions such as the importance of ICT for building a so called Knowledge Society, evidence that the country has a shortage of e-skills, and the perceived need that these skills must be acquired (Mitrovic, et al, 2012). The South African Department of Communications published its commitment to universal service and access, which stated that (Government Gazette of South Africa, No 32939, 8th February 2010, cited in Gomez, 2012):

- **Universal access** is provided where *all persons in all areas and communities* are able to obtain quality, affordable and usable access to a publicly available minimum set of quality electronic communications network service and electronic communications service, including voice, messaging and data electronic communications service and, in the case of data, including a broadband connection, and access to emergency services using free calls and messaging; and broadcasting service, including television and sound broadcasting service.
- **Universal service** is provided where all persons, if they require it, are able to obtain quality, affordable and usable access to a minimum set of electronic communications network service and electronic communications service, *on either a household or individual basis*, including a voice and data electronic communications service and, in the case of data, including a broadband connection, and access to emergency services using free calls and messaging, where all services are offered on a non-discriminatory basis.

Yet, the Household Survey by Statistics South Africa in (2008, cited in Gomez, 2012) 15% of households have a computer, and 7.3% have Internet access. The ITU' ICT development index ranked South Africa's ICT performance to have fallen from 77th in 2002 to 91st in 2007 to 92nd in 2008 (ITU, 2009,2010, cited in Gomez, 2012). The ITU describes South Africa as having "*relatively low access and usage values*" and further asserts that "*little progress was made during the past five years, in particular on ICT usage*" (ITU, 2009:33, cited in Gomez,2012). Although South Africa has the best developed telephone system in Africa, and a vibrant ICT sector worth an annual investment of USD\$9.6b, according to the World Economic Forum (WEF, 2006), its

infrastructure is poorly linked and unevenly spread across the country (Isaacs, 2007).

In response to these concerns the National Development Plan (2011: 173, cited in Gomez, 2012) recognized that “...if ICTs are also to perform a development function, an adequate range of infrastructures, services and content must be made available...” and further that “...this is not simply a social intervention [but] a necessary condition to grow and stabilize the national economy”.

The e-Skills Institute (e-SI), through the SA government and the Department of Communications (DOC), was originated to create and execute an e-skills agenda in a “*systemic and systematic manner*”. The primary focus of e-SI is to engage with a wide network of stakeholders to develop a collaborative and integrated national policy with respect to “*e-skilling the nation for more equitable prosperity and global competitiveness*” (National e-Skills Plan of Action (NeSPA), 2010, cited in Mitrovic et al., 2012).

The e-SI held its first summit in 2010 which concluded that e-skilling in South Africa must move beyond the old paradigm of involving only input (e.g. required resources) and output (e.g. number of skilled people), and should embrace a new paradigm which required a shift in emphasis from inputs and outputs to *impact*, and that further involved a “*collaborative network architecture*” (Mitrovic et al., 2012). The diagram below is an illustration of the new approach:

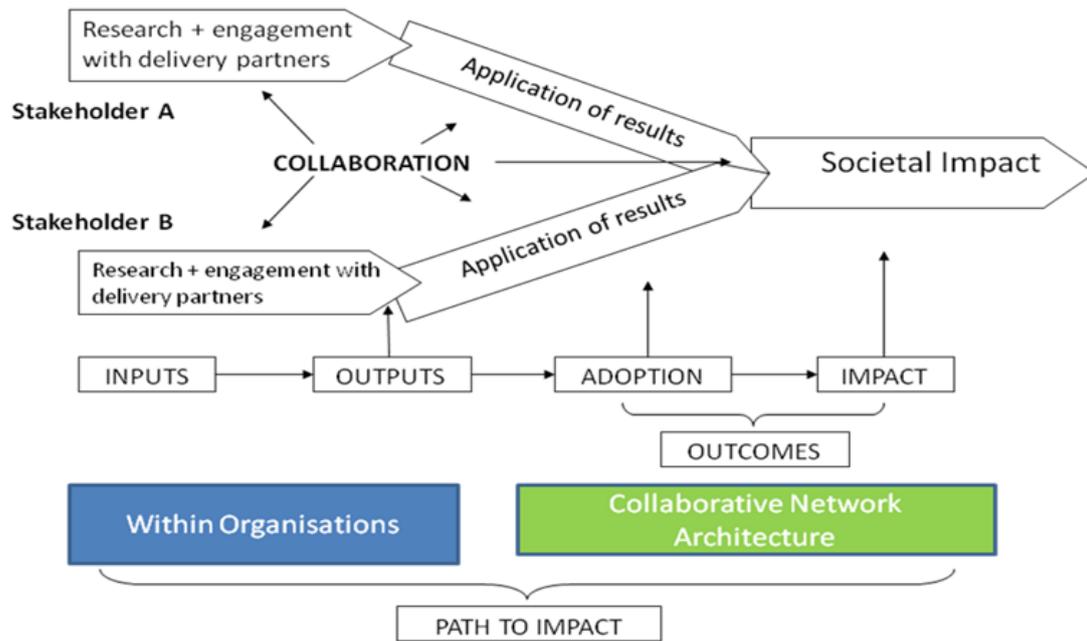


Figure 4: Path of Impact (Source: NeSPA, 2010, cited in Mitrovic et al. 2012)

The end of the first e-SI summit yielded five overarching themes (Mitrovic et al. 2012):

- Shaping NeSPA into a more comprehensive locally relevant and impact driven document;
- An on-going, sustainable and credible effort to develop an understanding of the nature and scope of lifelong abilities required by South Africans in the emerging socio-economic space, dominated by converging ICT;
- The establishment of regional e-Skills Knowledge Centre Net-work Hubs in a collaborative network architecture;
- Developing a differential transfer pricing mechanism to provide a basic level of free access to cell phones and internet connectivity; and
- Development and implementation of a high priority need for sectoral e-skilling approaches.

One of the mandates from the first e-Skill Summit was to develop the National e-Skills Plan of Action (NeSPA) guided by propositions within the Medium Term Strategic Framework (MTSF, 2009), and provide elements for national policy designed to:

- Reflect a national consensus in terms of e-Skills priorities, based on collaborative input from all key Stakeholders (Government, Business, Education, Civil Society and Organised Labour);
- Continuously leverage international benchmarks and good practices (from countries such as Finland, Korea, Australia and the EU) adapted to South Africa's culture and environment, while taking advantage of South – South Cooperation opportunities (including Egypt, Brazil, Cuba, and India);
- Provide a coordinating framework for the effective implementation of current and future e-Skills initiatives matching the developmental, economic and societal needs of South Africa;
- Coordinate existing e-Skills capacity and resources to maximize impact, reduce duplication of effort, and act as a focal point for the development of measureable e-Skills competencies;
- Identify current national and international success stories for adaptation, replication and scaling across South Africa, and share them with the rest of Africa for necessary adaptation, replication and scaling;
- Provide for a framework of relevant coordinated pedagogy development and delivery across the Higher Education Institutions, Sector Education Training Authority (SETA), corporate, and informal e-skills enhancement environment;
- Provide a framework for sharing knowledge based on Provincial and Local “good practices”;
- Propose fully cost solutions owned by key Stakeholder Groups, to match current and future skills gaps for key sectors identified in the Medium Term Strategic Framework (MTSF) 2 and Industrial Policy Action Plan (IPAP) 2013 as national priorities;
- Specify performance metrics to facilitate measurement and evaluation of Impact, Return on Investment (ROI) and Return on Objective (ROO) for the NeSPA Implementation Plan;
- Address Political, Economic, Social, Technological, Environmental and Legal (PESTEL) considerations and identify current Public Sector constraints that need to be addressed;

- Prepare an e-Skills requirements map, displaying the skills paths and needs from beginner to expert for MTSF priority areas for economic growth and social development, i.e. sustainable development;
- Define an appropriate "Enabling Environment" in which e-Skills development will thrive; and
- Identify key barriers to success and opportunities for driving synergistic initiatives.

NeSPA (2010, cited in Mitrovic et al., 2012) identifies a number of key success factors that will drive e-skilling:

- **Collaborative approach** across existing effort and gaps to action the e-Skills agenda;
- The need for a **comprehensive research program** that **will inform policy development, practice, service delivery** and (lifelong) **education**;
- Action within "**A Path to Impact**" based approach to enhance the delivery of established policies and programs and build new approaches;
- **Cooperative network architecture** based on nodes at **local level**;
- **Affordable access** to **ICT**;
- **Focus needs** to include **support for small, micro, and medium enterprises** (SMME's);
- **Effectively use existing resources**;
- **Focus** on **Medium Term Strategic Framework** (MTSF) 2009 – 2014; and
- **Start** the National e-Skills Plan of Action (NeSPA) **with a few overarching projects**.

In relation to research-based policy development, a number of themes have emerged to guide the policy-making process. The policy-making related thematic areas include:

- **the current e-skills situation in South Africa**– including benchmarking and progress against the MTSF goals;
- **infrastructure and access**– including convergence, new models of access for underserved communities;

- **ICT in education**– including the alignment of current and future pedagogy aligned to the MTSF;
- **ICT in business**– including both the synchronous and asynchronous use of converging technologies in bimodal service delivery; and
- **ICT and the community** – including the use of social media in meeting the needs of the MTSF.

In researching these areas priority must be given to: (i) more equitable access model to infrastructure, and (ii) needs of the community (Mitrovic, et al., 2012).

2.2.2 Defining E-skills

Wide reading of the literature indicates the difficulty in capturing a uniform definition for e-skills (Lanvin et al, 2008; Philip Schmidt et al, 2008; CEN, 2010; Mitrovic, 2010). It seems that the framework adopted by the 2004 European e-Skills is used as the base in many countries. In South Africa, that framework was adopted by the South African e-Skills Council and developed in the way that depicting an ICT skills pyramid. This ICT skills pyramid illustrates e-literacy locating the bottom layer of the pyramid, moving up toward R&D capabilities right at the top (Vanska et al., 2008, cited in de Villiers et al., 2012).

- **R&D Capable Practitioners:** Capabilities required for researching, designing and developing ICT systems.
- **ICT Practitioners:** Capabilities required for researching, developing, designing, managing, producing, consulting, marketing, selling, integrating, installing, administrating, maintaining, supporting and servicing ICT systems.
- **ICT user skills:** Capabilities required for effective application of ICT systems and devices by the individual. ICT users apply systems as tools in support of their own work, which is, in most cases, not directly related to ICT. User skills cover the utilization of common generic software tools and the use of specialized tools supporting business functions within industries other than the ICT industry.
- **E-business skills:** Capabilities needed to exploit opportunities provided by ICT, notably the Internet, to ensure more efficient and effective performance of different types of organizations, to explore possibilities for new ways of

conducting business and organizational processes, and to establish new businesses.

- **E-literacy skills:** Capabilities needed to socially appropriate ICTs for local development. This concept extends the digital literacy concept as defined by the European e-Skills Forum, namely that, “Being digitally literate implies being able to search and retrieve information to navigate and communicate on-line, to participate in digital and virtual communities. It is perceived as a key element in the battle to overcome social exclusion and division in the information society”.

The e-skills classification in NeSPA (2010, cited in Mitrovic et al., 2012) broadened the definition of e-skills in the following way:

- **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 and productivity.
- **e-User Skills:** focusing on enhancing the efficiency of public and private sector knowledge workers.
- **e-Practitioner Skills:** aimed at enhancing the capacity of public and private sectors 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.

One of the complexities of analysing skills associated to the use of ICT is finding a definition that is suitable for, and can be applied to any context (Romani, 2009). For his study Romani (2009) opted to use the term e-competent user as his reference. Bytheway (2011) makes the distinction between competencies and skills. Skills can be seen as a low level thing (*'I can work this computer'*), whereas competency operates at another level (*'I can use this computer to produce a useful econometric model'*). According to Mulder et al. (2006) competence has a long history, as early as Plato (380 B.C) and the "Code of Hammurabi" (1792-1750 B.C), which is not unsurprising, "*since to be professionally competent; being sufficiently capable and allowed to perform certain tasks, has been an inspiration throughout the ages*".

However, Anttiroiko et al. (2001, cited in van Deursen, 2010) add that there are two dimensions to competence: *knowledge* and *skills*. Knowledge refers to understanding the everyday way of how the world is constituted and works. Skills, however, is the practical ability in the way we apply our knowledge. Skills are therefore viewed as the technical aspects of competence (ibid). Van Deursen (2010) goes further than limiting only the technical aspect of skills, and suggests that skills are interactive in nature since it involves not only reading and writing on keyboards and screen, but also interacts with programs, people, transaction in goods and services, and the making of decisions. Romani (2009) believes that being e-competent is to possess "*a set of capabilities, skills and abilities to exploit tacit and explicit knowledge, enhanced by utilization of digital technologies and the strategic use of information*". There are five underlying concepts that describe e-competencies: *e-awareness; technological literacy; informational literacy; digital literacy* and *media literacy* (Figure 5.)

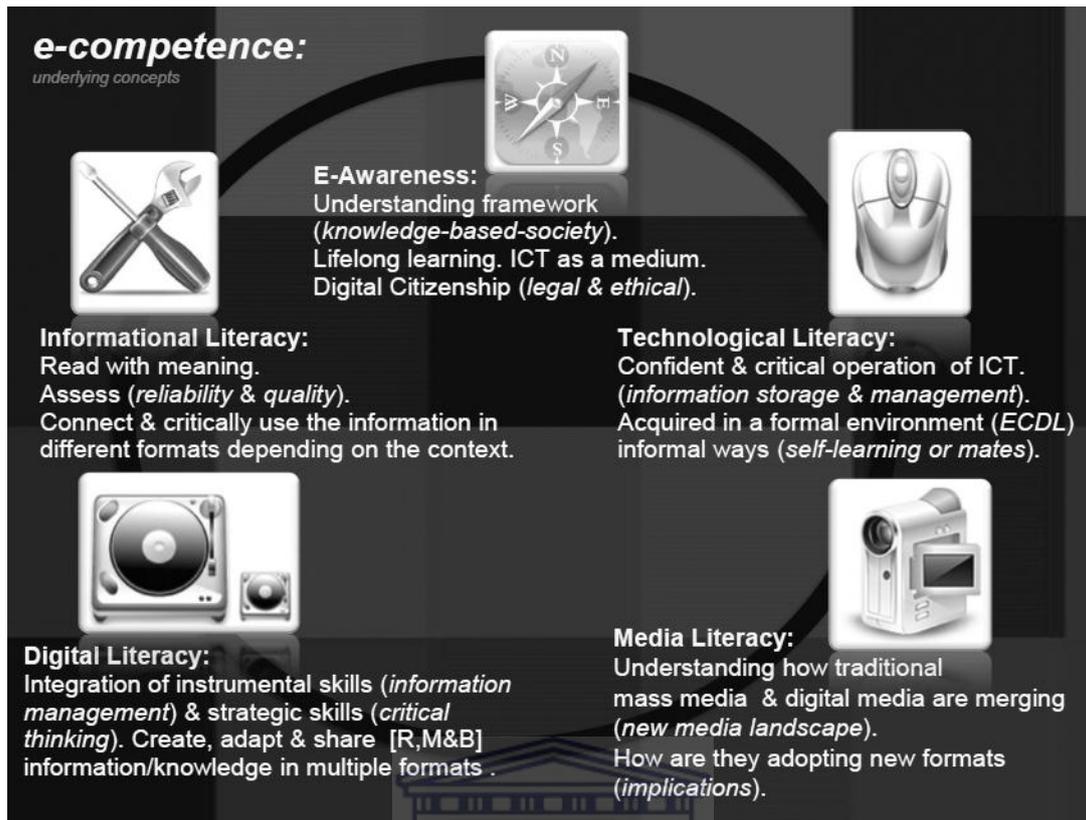


Figure 5: E-competencies & the five underlying concepts (Source: Romani, 2009)

From within the South African context the concept for e-skills is proposed 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” (NeSPA, 2010: 2). In this context the set of e-skills are identified as mentioned earlier.

Morris (2009) uses the concept Digital Life Skills to denote a certain set of e-skills adults will require for them to function in a digital society. Digital life skills is defined as a *“set of basic ICT skills an individual requires to use a computer to safely enter, access and communicate information online”* (Morris, 2009:9). The benefits in acquiring digital life skills will result in social inclusion, equality of access to information and services, employability, business productivity, learning and skills.

According to the iSkills report (2007) ICT must be distributed equitably as possible, and that not only the absence of equity but also the lack of cognitive skills to effectively use ICT should be a new way of understanding the digital divide. Thus, besides access to technology, developing data about literacy of people to integrate technology into daily lives is important, educational policy should significantly invest in creating new training and education curricula to measure and understand the effective use of ICT (iSkills, 2007).

Ala-Mutka (2011) argues that despite the multi-layered conceptual landscape of digital competence, the necessity that everyone should be digitally competent is the ultimate objective. The 21st century digital competence must include “*instrumental knowledge and skills for tool and media usage, advanced skills and knowledge for communication and collaboration, information management, learning and problem-solving and meaningful participation. These must be supported by intercultural, critical, creative, responsible and autonomous attitudes*”. Ala-Mutka (2011) further suggests that developing a conceptual model is only a first step. Collaboration with stakeholders is necessary to develop proper learning and assessment guidelines that are usable and useful to support digital competence development.

2.2.3 E-inclusion as a foundation of e-skills policy framework

It seems that the modern literature pays much attention to a question of how does one proceed from a socially excluded e-society to an e-inclusive one. According to Sen (2000, cited by Zheng & Walsham, 2008) social exclusion is a result of capability deprivation meaning being excluded from social relations or not being able to interact freely with others, and subsequently leading to capability poverty. The capability approach (CA) developed by Sen (1992) refers to the “*concept of ‘freedom’ [which] in a broad sense refer to effective opportunities we have to lead the kind of lives we have reasons to value*”. Amartya Sen (Zheng & Walsham, 2008) proposed CA as an alternative approach to mainstream economic theories and egalitarian approaches that focused solely on material inequality, while he argues that inequalities were much wider than that, and include “*lack of opportunities, freedoms and choices*”. Foley et al. (2002) suggest that there are number of barriers that impact adoption and use of ICT among those classified as socially excluded. These include:

- **Socio-economic** and **socio-personal factors**: the former is usually associated with low-income, low levels of education, low skilled jobs, unemployment and lack of technological or computing skills; the latter: socio-personal barriers are associated with attitudinal and behavioural factors, such as showing low levels of interest, awareness, understanding and acceptance of ICT. It is wrong to assume, according to Foley et al. (2002), that socio-economic factors are the main barrier, their findings suggest that socio-personal factors are equal in importance among the socially excluded groups;
- **Education**: low levels of education are barriers to adopting and use of ICT for reasons related to: *first*, although basic ICT use does not require high levels of educational attainment, it does require basic literacy skills such as reading and writing; *second*, low educational levels are an indication that individuals besides lacking basic literacy levels, also will lack basic computing and technological skills to use ICT; *third*, inadequate education or inability or unwillingness to attend educational institution for learning, will limit access and use of ICTs; *fourth*, adverse reactions caused by past experience at formalized educational institutions result in negative perceptions among some and create ICT learning barriers when having to pursue further education at these institutions;
- **Age and gender**: there is still a large gap between the younger users who form the majority of ICT or Internet users than those among the older generation;
- **Cost**: although lack of affordability influences ICT usage, issues of interest or skills had higher ranking order.

Van Dijk (2012) states that the notion of inequality (digital divide) must be measured or understood within a relational or network approach than the more common approach focusing on individualistic notions. The units of analysis in trying to understand inequality should focus on the positions of individuals and the relationship that exist between these, than to focus on individual indicators. Inequality exists as a result of differences between groups of people, than the concerns of individual attributes. Van Dijk (2012) developed the resources and appropriation theory (Figure 6) that depicts four notions of inequality. Van Dijk's

model (Van Dijk, 2005, cited in Lupac & Sladek, 2008) starts with exploration of the social formations contributing to kinds of inequities: culturally and historically maintained conditioning, for example “*young-old, male-female, white-black, and introvert-extrovert*) and positional (*employed-unemployed, employer-worker, parent-child, city-rural area, and high education-lowed education*) categorical inequalities.” As these digital inequalities persist those at the “*wrong end*” of this divide will become second-class or third-class citizens (van Dijk, 2005).

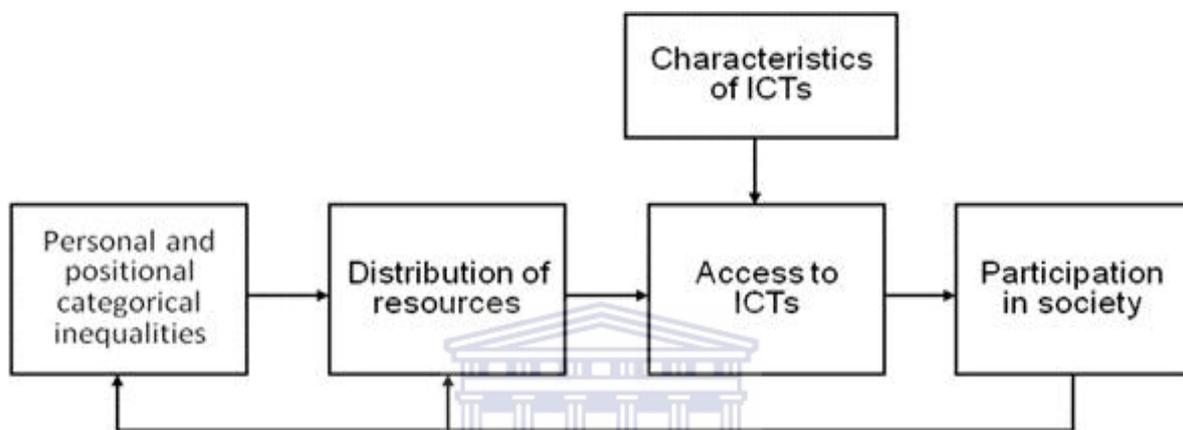


Figure 6: Causal Model of Resources and Appropriation Theory (Source: van Dijk, 2005)

Nash (2011) argues that digital inclusion requires a broader approach, since ICT are not so much hierarchical as they are non-linear, behaviours are more networked and act upon the realms of social and digital exclusion. Van Dijk (2012) suggests that mitigation against inequalities of the digital divide and digital skills can be done by developing deliberate policies for the labour market, the training of employees, and improvement of educational standards at all levels, including adult education. A helpful path is proposed by Damodaran & Heeley (2009, also cited in Malek et al. 2012) who describes the concept of digital inclusion as citizens empowering citizens going beyond “*users and choosers*” of technology and becoming “*makers and shapers*” of technologies, and where citizens become “*actively engaged in the creation of socio-technical systems*”. Such practice already occurs according to van Dijk (2012) as “*most digital skills are not the result of computer courses, but of learning through practice in particular social user environments*”. Van Dijk (2005, cited in Lupac & Sladek, 2008) has refined his resources and appropriation model

into four successive stages theoretical framework of access to ICT for research constituting (Figure 7): motivational, material, skills and usage access.

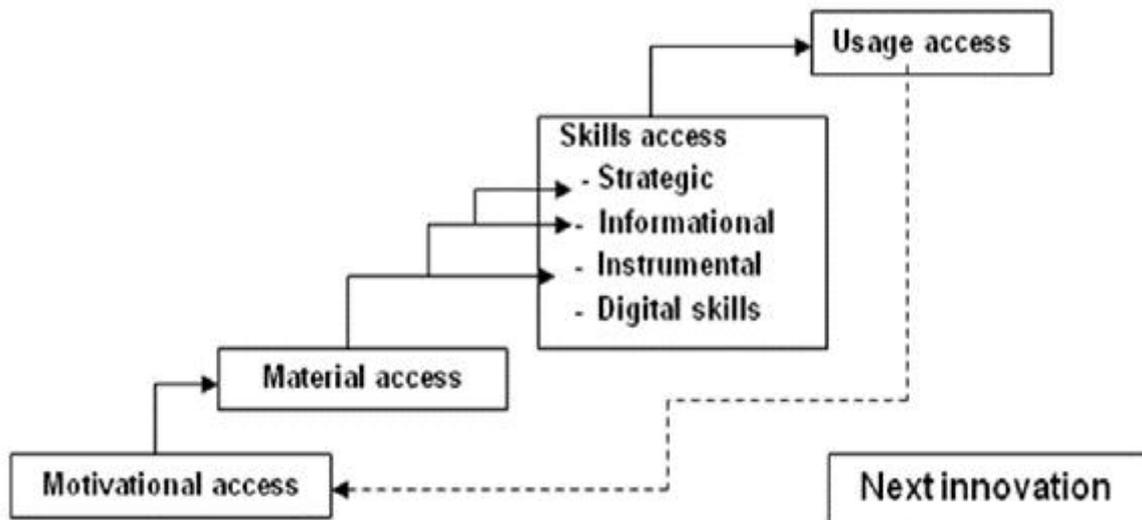


Figure 7: A cumulative and recursive model of successive kinds of access to digital technologies (Source: Van Dijk (2005), cited in Lupac & Sladek, 2008)

Motivational access refers, for example, to indicators of interest for use or non-use of Internet or computers, such as, either having no time, ignorance, misunderstanding, or other substitutive forms of communication through mobile phones or face-to-face interaction. **Material access** can be understood based on five factors such as *gender, age, social status, education and net monthly income*. **Skills access** is viewed as successive stages of skills interaction initiated by instrumental toward strategic access which defines being digitally skilled. Van Dijk (2005), cited in Lupac & Sladek, 2008) uses the term digital skills as “*the collection of skills needed to operate computers and their networks, to search and select information in them, and to use them for one’s own purposes. Within the digital skills succession, operational skills are the skills used to operate computer and network hardware and software. Information skills are the skills needed to search, select, and process information in computer and network sources. Finally, strategic skills are capacities to use these sources as the means for specific goals and for the general goal of improving one’s position in society...*”. **Usage access** describes the final stage which represents the use of specific media for personal purpose and taste.

According to Ala-Mutka (2011), the major challenge is for users to develop the capability to benefit from the various digital opportunities available. The concern raised by van Deursen (2010, cited in Ala-Mutka, 2011) based on research is that the Internet strengthens traditional forms of social inequality. This concern is echoed by DiMaggio et al. (2004, cited in Ala-Mutka, 2011): “...*Internet competence is related to the satisfaction users derive from their experience, the extent to which they find it stressful or rewarding and therefore the extent to which they persist in Internet use and acquire additional skills...Based on these observations we might expect inequality in competence to deepen inexorably, as skilful users find the Internet rewarding and acquire greater skill; and less able users grow frustrated and turn away*”. Ala-Mutka (2011) argues that Internet (ICT) use should not be viewed as proof of being digitally competent -*policies* and educational approaches should aim to provide *awareness* and *learning opportunities* for all.

Having in mind the above discussion, it is apparent that the e-skills agenda should be more than rolling out ICT skills to people. It has to be a deliberative process targeted at unpacking digital and social exclusion within the South African context and to develop strategies and policies that address issues around capability deprivation. Whatever strategies and policies are put in place, there is a need to focus on capabilities for using ICT in ways relevant to development priorities (Tella & Olorunfemi, 2010). As stressed by Tella & Olorunfemi (2010): “*When ICT strategies and policies are in place, a limited investment in human and technological capabilities can have an enduring, catalytic effect on development concerns, including poverty, gender inequalities, and the environment*”.

2.2.4 Rationale, benefits and impact of e-skills on society

The reason for having e-skills is that it permits persons to participate more effectively in the global information economy and society (Knowledge Society), have access to opportunities to do business and to engage in more efficient transactions (Schmidt et al., 2008). In a survey on the Internet use in developing countries, Schmidt et al.(2008) found that a substantial number of respondents cited lack of skills as the most common reason for not using the Internet. The same survey showed that 25.4% of South Africans, (based on national extrapolations), did not know how to use computers. This may be reason why a review in 2001 of telecentres for the

Commonwealth of Learning, found that personal computers and the Internet were severely underutilised in South Africa (Oestman & Dymond, 2001, cited in James, 2011) – also proving the e-skills shortage has a long history in South Africa.

Lanvin & Kralik (2008) and Lanvin & Passman (2008) point out to the importance of e-skills by stating that: (i) *e-skills are pervasive and therefore, required in all sectors and at all levels of activity to sustain competitiveness*; (ii) *the emerging global knowledge economy will push for more e-skills*, and (iii) *e-skills will enhance a person's horizontal and vertical mobility, improving employability opportunities*.

Foley et al. (2002) state that as important as access to ICT are, if users do not possess the basic computing and ICT skills they will be unable to use the technology even if it is readily available to them. What is interesting about their findings is that ICT users believe access is the most important to encourage ICT adoption, while for non-users, to encourage ICT adoption was not access but training coupled with low cost. Schmidt et al. (2008) highlight that the role of a competitive ICT sector with a proper regulatory environment can, besides driving down cost to ensure wider access and usage, will encourage sustainable ICT development which in turn impact on economic development and growth.

In a study on the value of skills, evidence shows that skills contribute to economic and social value (Garrett & Campbell, 2010). Acquiring the right set of skills is the key to adding value to the productivity and prosperity of a nation. The importance of skills is one of the six pillars of the ICT ecosystem: *“Best-practice countries have a solid base of ICT technical skills and a good level of broader science and math education. Interventions to improve ICT-relevant skills include focused training, certification and pipelines to university graduates in engineering and IT fields”* (World Economic Forum, 2009:2 cited in Nash, 2011).

Skills acquisition is seen as the way out of poverty and of a workforce delivering more towards a competitive Europe (European Commission, 2010, cited in Nash, 2011). Verheugen (2007) asserts that a highly skilled, knowledgeable and adaptable workforce will contribute to a nation's competitiveness and prosperity in the 21st century. According to Garrido et al. (2012) ICT occupations demand an important slice of economic activity. A study issued by the OECD (2006, cited in Garrido et al.

2012) estimated that 20% to 30% of total national employment was ICT related. About three to four percent of these ICT jobs were held by “specialists”, while those with basic or advanced ICT skills held the remainder of ICT-related jobs. Garrido et al. (2012) state that besides improved computer skills, the benefits of ICT skills training not only draws users into developing non-technical workplace skills, but they also are propelled into self-directed learning and participate in extended social networks that facilitate employability.

The concept of employability is an important one as it is not restricted to the variables commonly used in measuring labour markets factors. This concept is particularly important in South Africa as unemployment is persistently high in the last decades. Employability is commonly defined as the “*combination of factors and processes that enable people to progress toward finding employment, to remain employed and/or advance in the workplace*” (Garrido et al. 2012). Employability is enhanced by a person’s skills and further on-going skills development. E-skills are key components that feature within the employability framework of companies throughout the world. Furthermore, digital competence is an important driver of digital inclusion since “*to be effective a smart, sustainable growth strategy must also be inclusive so that all Europeans are given the opportunities and skills to participate fully in an Internet-enabled society*” (European Commission, (Granada), 2012:1, cited in Nash, 2011). According to Nash (2011), users are operating more in a non-linear environment due to the advancement of technology. And though skills development is important, it should not be equated with the notion of inclusion. According to Wouter van den Bosch (2009:3, cited in Nash, 2011) “*...we should also look beyond skills and training alone, as what people expect, want and ‘consume’ on the Internet is also related to socio-economical status*”.

In this respect policy-making should become more participatory as people do not simply want to be recipients of services but participants in shaping their own future. In terms of its broader understanding skills training represent only potential productivity, whereas the purposive application of skills in the workplace leads to actual productivity (Fraser, 2010). Kamal and Qureshi (2009) suggest that “*contrary to expectations...growth may not necessarily be related to ICT infrastructure or skills but that the latter two variables are related*”. Their argument is that as both

infrastructure/networks and skills move in the same direction, studies on skills and ICT infrastructure must be conducted as a unified ICT construct that includes both variables.

Foley et al. (2002) paves a process for policy intervention to get socially excluded groups to benefit from ICT use: *“the bottom line is that if there is no benefit to socially excluded groups in using ICT as they are very unlikely to make use of it. If these benefits or impacts are known they can become the focus for initiatives and other policy elements earlier in the policy development framework and the needs of socially excluded groups will be met and the digital divide overcomes”*.



Figure 8: Process for policy intervention (Source: Foley et al. 2002)

It is essential to understand the benefits and impact of ICT for socially excluded groups for effective policy intervention. A lack of proper research on the motivations, expected benefits and use patterns among these groups is akin to adopting a technocratic approach suggesting that all is required is access to technology and everyone will use it. A more suitable approach is to adopt a citizen centric or user focused perspective for more effective policy development (Foley et al., 2002). To achieve the right policy impact, it is important to undertake research into ICT awareness to establish (Foley et al., 2002):

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

It seems that encouragement to skills training and development will be made more meaningful should a more user focused perspective form part of the policy development initiative. Such an approach to the policy-making is adopted by the e-skills policy framework proposed in this thesis.

According to Van Deursen (2010, cited in Ala-Mutka, 2011) there are various ways that digital competences and skills benefits communities, individuals and society:

- **Social benefits:** ICTs connect people, socially and culturally integrate communities, provide interaction channels for the elderly, those in remote villages and alike;
- **Health benefits:** There are plenty of health information and community resources online;
- **Economic benefits:** Being digitally competent has become a major issue in terms of a person's employability;
- **Civic benefits:** There is a vast range of up-to-date information and resources that can be accessed from digital tools and media;
- **Cultural benefits:** The availability of Internet and various social platforms such as blogging provide a new stage for people to interact with one another and share wide range of information; and
- **Societal benefits:** ICTs have permeated all areas of life by which people are able to use the Internet to get a good education, set up a business, travel, gain opportunities for lifelong learning, enjoy quality of life etc.

In that regard, the sections that follow provide a way of understanding the benefit and impact of e-skills on individuals and society at large.

2.2.5 Context-awareness: Social user context and environment

A study by Yong-Chan Kim et al. (2007) on ethnicity and connectedness, among groups in Los Angeles, concludes that geo-ethnic characteristics contribute significantly to how different socio-cultural groups connect to ICT, especially the Internet. A contributing factor in studying ethnic groups in the geographical context is the emergence of different patterns of connectedness to the Internet. This study indicates how social environments have a bearing on patterns that shape people and their understanding of the world around them. Verheugen (2007) states that innovation starts with people which is why e-skills are important. E-skills are *"not just pure technical skills: successful innovation in ICT requires also cross-disciplinary, cognitive and problem solving skills as well as understanding of fundamentals of business"*. According to Liebenau (2007) attaining needs satisfaction corresponds to

a population's overall economic wealth, human capital and institutional legal environment.

It is believed (e.g. Coli, 2010) that increased development and improvement in these areas “triggers” resultant innovations to satisfy the enhanced needs that accompany such expansion. In other words where a population's overall economic well-being, human capital and institutional capabilities are weak, the impact on its innovative energy or at very least the expectation of a better life will remain low. Furthermore, Coli (2010) writes that the widening gap of digital divide can be attributed to the negative experiences of people leaving them disinclined ever to learn. The importance of developing a culture of self-belief (Bentivegna & Guerrieri, 2010, cited in Malek, 2012) where everyone starts to feel comfortable to click a mouse in the virtual world, becomes a much needed initiative to change patterns of thought and behaviour. In developing countries the digital challenges reflects an even greater societal divide involving poverty related issues such as homelessness and disenfranchised communities. For developing countries the challenges to tackle the digital divide are on two fronts: technological and social.

E-skilling is context-related and requires the right data to know how the stages of e-skills development will impact the context issues. The South African e-Skills Institute understands this approach stating that “*while the traditional deterministic approach of throwing resources at the problem of under-developed ICT skills doesn't work, neither does bringing experts in from the outside nor 'painting over the cracks in ICT skills'. The key is to consider both the demand and supply side of e-skills (ICT skills) in South Africa*”, (e-SI newsletter, August 2012:1). Mitrovic et al. (2012) articulated these concerns that e-skills solutions for South Africa cannot be replicated from the more developed countries as those solutions largely revolve around ‘practitioner’ (professional) e-skills, while countries like South Africa are constraint by huge social and economic disparities, massive illiteracy and considerable “digital divide”. However, policy creation should take into consideration (i) internationally recognised e-skills frameworks such as SFIA or EeCF, and (ii) local (SA) research in this area that adds new value (Mitrovic, 2010, cited in Mitrovic et al. 2012).

2.2.6 E-skills shortages and challenges

In South Africa there are many private institutions and other bodies such as the National e-Skills Dialogue Initiative (Ne-SDI), Joint Initiative on Priority Skills Acquisition (JIPSA) or the Media Information and Communication Technology (MICT) Sectoral Education and Training Authority (SETA) that have been launched to address the skills shortage in the country. In response, the South African e-Skills Council, advisor to the President, consisting of partners from government, private and education sectors came into existence as a recommendation by the Presidential International Advisory Council on Information Society and Development (PIAC on ISAD) in 2006 (Merkofer et al., 2009). However, as indicated in de Villiers et al. (2012) still insufficient success to redress e-skills remain. One of the concerns raised by Merkofer et al. (2009) regarding the adequate analysis, evaluation and forecast future demands for e-skills in South Africa, was the different definitions and conceptualisations used by government and the research institutions in describing e-skills. Alexander et al. (2009) confirm that researchers experience a number of methodological challenges in undertaking e-skills research in South Africa, such as absence of certain critical research elements, weak data, political influences, and skills classification difficulties. Other concerns raised are the lack of standardization among the various initiatives and why the need for so many multiple initiatives to address the same problem (de Villiers, et al. 2012). However, attempts are made to sketch the types of e-skills needed in South Africa. Information put out by MICT SETA and the Department of labour highlights the scarce skills required in the country (Table 1).

Table 1: MICT SETA (2008-2011) Scarce skills list (Source: De Villiers et al. 2012)

| Job Title | Total |
|---------------------------------------|-------|
| Computer Network and Systems Engineer | 464 |
| Developer Programmer | 417 |
| ICT Business Analyst | 410 |
| Software Developer | 408 |
| ICT Customer Support Officer | 390 |
| Team Manager | 366 |

| | |
|------------------------------------|------|
| ICT Support Engineer | 334 |
| Computer Systems Technician | 259 |
| Software Engineer | 215 |
| Systems Analyst | 167 |
| Technical Support Services Manager | 161 |
| ICT Sales Representative | 142 |
| ICT Project Manager | 134 |
| Analyst Programmer | 115 |
| Database Administrator | 111 |
| ICT Security Specialist | 102 |
| Systems Administrator | 102 |
| Total | 4297 |

The Department of Labour has published its own list of the ICT skills shortages in South Africa (Table 2):

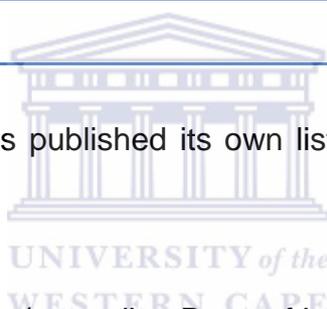


Table 2: National Scarce Skills (according Dept. of Labour, 2008, cited in de Villiers et al. 2012)

| Job Title | Magnitude of Scarcity |
|--|-----------------------|
| ICT Managers | 885 |
| ICT Support Technicians | 1630 |
| Business and Systems Analysts | 910 |
| Multimedia specialists and Web developers | 105 |
| Software and Application Programmers | 2890 |
| Database and Systems Administrators, and ICT Security Specialist | 220 |
| Computer Network Professionals | 820 |
| ICT Support and Test Engineers | 700 |
| Total | 8160 |

Naidoo et al. (n.d.) suggest that small training institutions are best suited to cope with the accelerating pace of technological change, easily adapt their training products

and offer more timely and relevant skills, whereas universities curriculum cycles that are reviewed every five years are slow in adapting to current demands. Firms who hire ICT related graduates have to resort to in-house training or outsource to smaller firms to upgrade graduates with the latest skills (Klaas & Gainev, 2003; Tyler, 2004, cited in Naidoo et al., n.d). This dynamic nature of these small private providers compared to the larger providers points to their importance to a national e-skills strategy. The Information Systems, Electronics and Telecommunications Technologies Sector Education and Training Authority (ISETT SETA) state that approximately 86% of those accredited as training providers are small and micro enterprises (ISETT SETA, 2010, cited in Naidoo et al., n.d.). Very little is known about the e-skilling training products provided by these providers as such policy-makers and other key role players must create mechanisms to monitor, develop awareness and encourage alignment among this key sector (Naidoo et al., n.d.).

In a study among vendors offering e-skills training to small and medium-sized business in South Africa, Naidoo et al (n.d.) provide description of the types of courses that are provided (See Figure 9). Most of these courses on offer are based on Microsoft applications that supply training in e-skills categories such as e-literacy, e-user and e-business, while e-practitioner skills are more specialized.

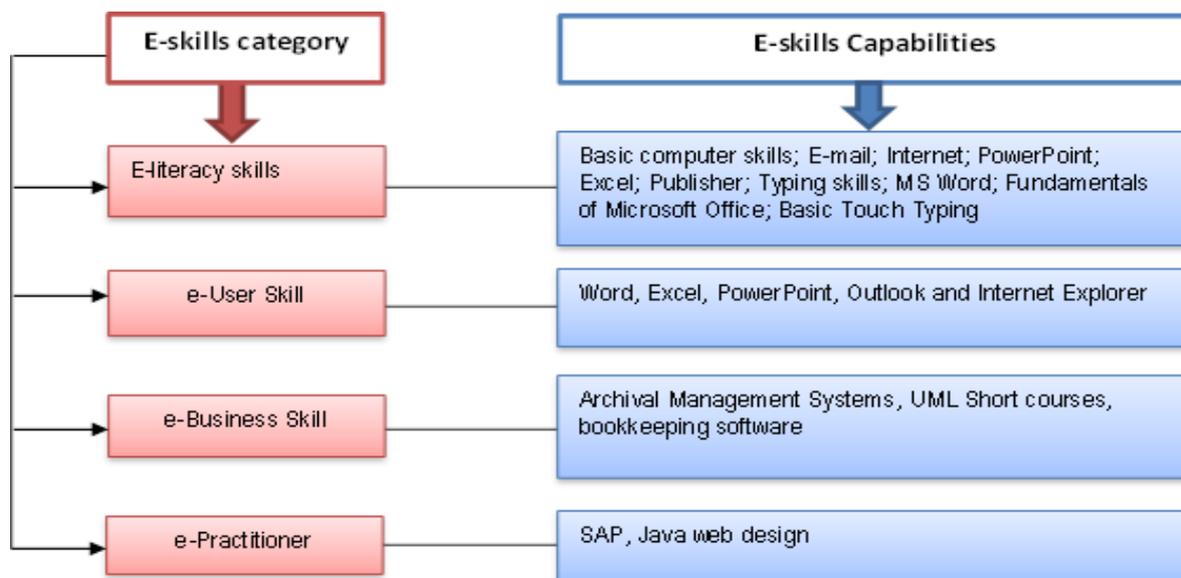


Figure 9: Summary of project offerings of major e-skill category (adapted from Naidoo et al.,n.d.)

According to the Information Systems, Electronic and Telecommunications Technology Sector Education and Training Authority (ISETT SETA) in South Africa, their members have articulated implications on ICT skills development that impact the sector in the following ways (ISETT SETA, 2011):

- Unless there is a willingness by the industry to clearly articulate their skills requirement the risk exists that they stand to fall behind and it will take years to reverse the backlog;
- Qualifications are not always obtainable locally impacting on cost to send people abroad;
- IT security will require constant skills development;
- Specialist skills knowledge will be in constant demand;
- Training is not always demand led, meaning that inappropriate subject and career choices are made;
- More collaboration between business and tertiary institutions is needed;

The South African e-Skills Institute has also realised the shortage of e-skills in South Africa. As stated in Mitrovic et al. (2012), obtaining appropriate e-skills is not a once-off event since the speed of technological changes requires continual kept up-to-date and relevancy of ICT-related skills –and this is one of the reasons for a short supply of e-skills in the South Africa, causing the country to slip down the international ‘e-readiness’ rankings. It is estimated that South Africa currently experiences a shortage of over 70,000 IT professionals (ITWeb, 2008). Mitrovic et al. (2012) further state that the shortage of e-skills is “*even more worrying because of the fact that the supply of ICT graduates is now showing a decline*” (Accenture, 2008). This general lack of e-skills is seen by the South African Department of Communications (DoC) as a serious impediment to the Nation meeting its commitment to the Millenium Development Goals (MDGs), the World Summit on Information Society goals (WSIS, 2005), New Partnership for Africa’s Development (NEPAD) and the South African Medium Term Strategic Framework (MTSF) 2009-14 (DoC, 2007).

2.2.7 Collaborative e-skills ecology

To improve on ICT policies, collaboration between government, industry, educational sectors, research institutions, civil society and other stakeholders are highly important (NeSPA, 2010). Merkofer et al. (2009) believe “*that the only way a country*

can become an ICT 'powerhouse' is if all relevant stakeholders join hands and work together to increase the skills base, the adoption of the technologies and the utilisation of facilities". The e-SI Newsletter (December 2012: 3), states that "*multi-stakeholder collaboration has become the de facto way forward to ensure alignment with stakeholder needs and national goals as well as increased impact*".

The importance of the collaborative approach to policy-making also confirms the latest thinking in the European Union. The personal opinions, corporative interest, lobbying, ideological values and other "non-measurable" factors can only be captured during the interaction of stakeholders and policy-makers interact within social networks. These factors, which are not research obtained, often prevail on the scientific evidence (DAE, 2013).

The notion of collaborative e-skills ecology is used in this thesis since there are so many aspects that define the role, influence and impact of multi-stakeholder environment and involvement. MIT Press (2000, cited in Brown & Lautenbach, n.d.) defines an information ecology as "*a system of people, technologies and values in a local environment*". Nardy & Day (1999) make the claim that information ecologies by nature of their teaching-learning environment draw in student to participate and contribute to a culture of electronic learning. However, according to some authors (e.g. van Aswegen and Combrinck, 2004; Henning, 2003; Brown & Lautenbach, n.d), a counter-trend is witnessed in South Africa, especially in previously disadvantaged community sectors. Data from their study show that teachers doing postgraduate studies in educational computing do not transfer their ICT competency skills to their teaching practice. Reasons for this include findings as lack of adequate electronic learning environment; and educational jealousies that obstruct access to ICT facilities at schools.

Furthermore, the World Economic Forum (2009:8 cited in Nash, 2011) provides insight why attention must be paid to what it calls the complexities of the ICT ecosystem: "*as the growth and adoption of networked ICT services expand, policy-makers must appreciate the unique behaviours of complex ecosystems. The behaviours of networked economics are non-linear*".

In broad terms skills ecosystems are defined by their interconnected relationship among entities. Cooney et.al (2010) state that the skill ecosystem has three points in common with other related inter-related systems:

- that institutions play an enabling role;
- that networks are important phenomena; and
- that location is important.

Rather than defining the skills ecosystem, institutions enable relationships but not how these relationships will develop, networks are closely knit links of trust and for sharing of knowledge, close relationship are forged around the shared value of specific or critical resources within a locality.

Ashton, Sung et al. (2000, cited in Schwalje (2011) state that in the early 1990's a change emerged which viewed formal education systems and training as those solely responsible for supplying of skills. The emphasis was placed on the *"relationship between governments, educational systems, labor markets and firms to generate demand for skills"*. A conceptual model developed by Schwalje, (2011, Figure 10) depicts the role of key stakeholders in skills formation which aligns skills development within economic development, business and social measures. This model indicates the need for interdependence and collaborative networks to develop skills needed for a knowledge-based economy.

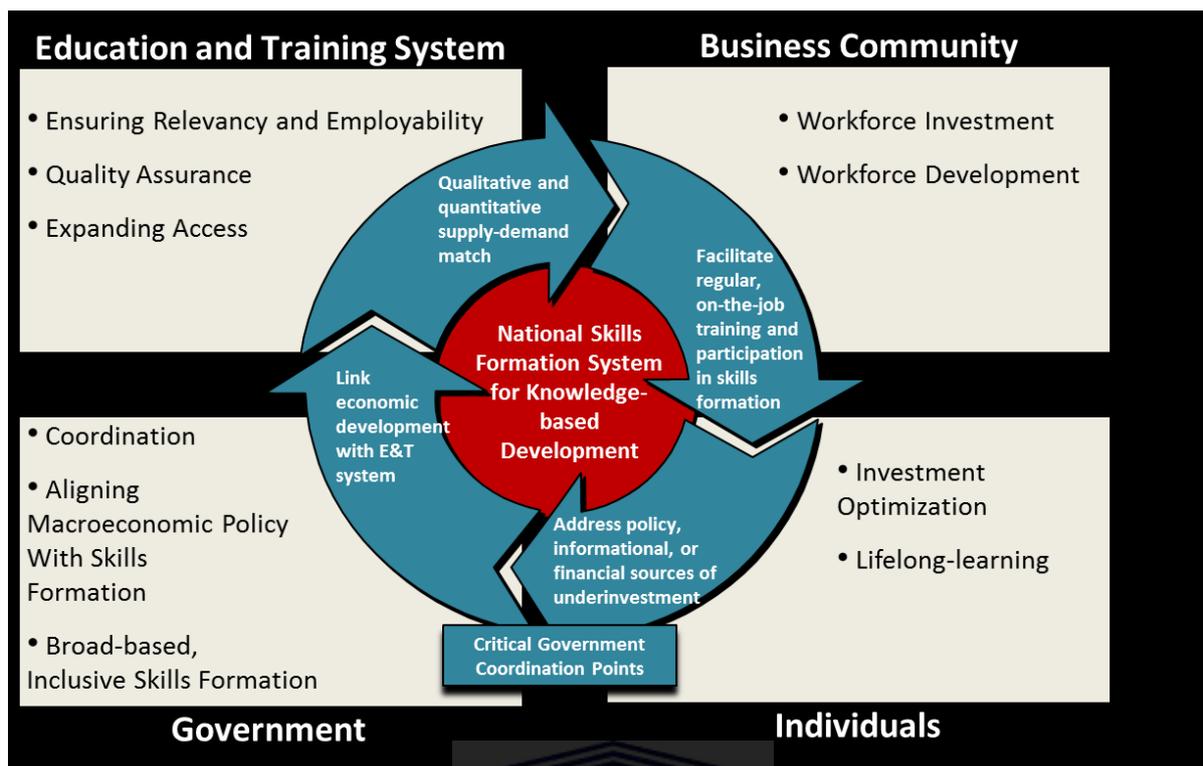


Figure 10: Conceptual Framework of a National Skills formation system for knowledge-based economic development (Source: Schwalje, 2011)

According to Fransman (2010, cited by Madikaze, 2010/2011) the concept of an ecosystem should be used as metaphor to understand and interpret the ICT sector. ICTs are like “*interacting organisms*” comprised of firms, universities, governments, various other stakeholders and consumers making use of technology products and services whose interactions continually change “*as learning and adapting takes place through a range of ‘symbiotic interaction’*”. Fransman (2010, *ibid*) expressed his concern that ICT governance institutions are too fragmented, thus his suggestion that regulators and policy-makers must consider the ICT sector as an ecosystem; in this way a much more coordinated approach will attend to either the weaknesses or strengths of the ICT sector.

According to Adam et al. (2007) a multi-stakeholder approach or partnership in policy development refers broadly to groupings of civil society, private sector, public sector, the media and other stakeholders coming together focusing on a common purpose such as to develop ICT policy and ensuring implementation. There is common understanding among the partners that they have different roles and purposes, but

that they pursue collective goals through collaboration to achieve such goals. The reasons for a multi-stakeholder partnership in delivering an ICT agenda include among others, “*an enabling policy and regulatory environment, access to basic infrastructure, accelerated development of basic ICT skills, development of appropriate content*” Adam et al. (2007). One of the key impact roles of the multi-stakeholder approach is registering support for ICT policy at national level. According to Adam et al. (2007), the broader goals that multi-stakeholder partnerships work toward include:

- Identification of specific ICT issues of priority and that affect social and economic progress;
- Carry out joint research and analysis to inform better policy formation and subsequent implementation;
- Pool resources, talents and other capabilities, thus to strengthen capacity to effect change;
- Building trust and understanding among stakeholders through sharing knowledge and providing solutions to problems;
- Develop guidelines for best practices for policy formation, implementation or changes;
- Build capacity of citizens through gains in knowledge and skills and overall confidence levels;
- Lobby policy and decision-makers for change;
- Raise ICT awareness through collaborating with the media; and
- Evaluate and monitor the progress of policy changes and implementation progress or successes.

Adam et al. (2007) list a number of ways multi-stakeholder partnerships benefit ICT policy development such as:

- Promote inclusivity and equity in ICT policy and implementation;
- Expand the analytical capability to address ICT issues;
- Promote grassroots mobilisation and participation;
- Foster the sharing of skills and innovation;
- Encourage good governance; and
- Promote ownership and commitment for action;.

According to Lanvin and Kralik (2008) knowledge intensive economies require e-skills experts that educational systems hardly are able to supply. To narrow the e-skills gap, all categories of stakeholders can be mobilized to drive a set of common objectives. INSEAD (cited in Lanvin and Kralik, 2008) has created a model of a possible multi-stakeholder approach to e-skills (Figure 11):

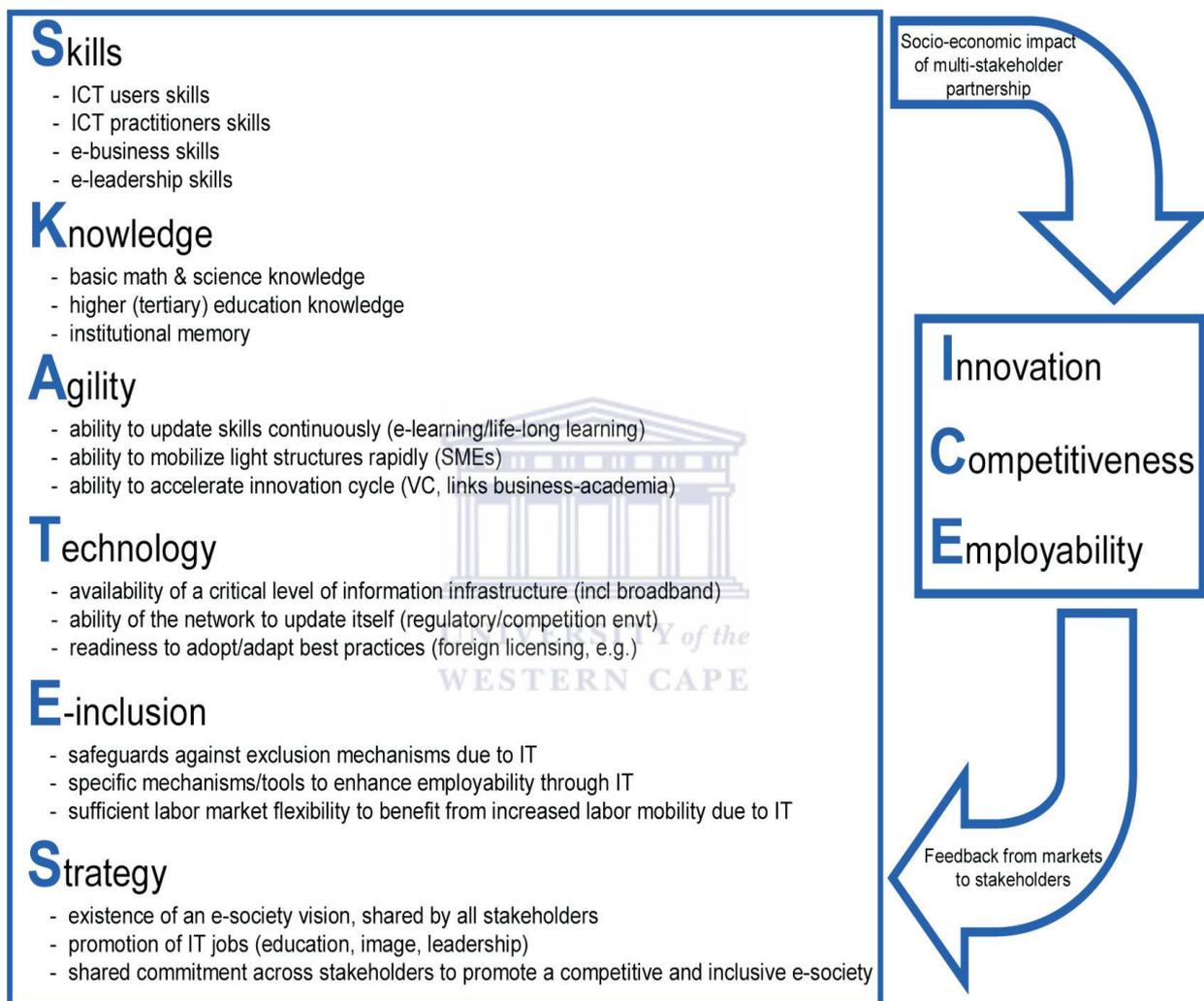


Figure 11: E-skills created by INSEAD (Source: Lanvin & Kralik, 2008)

According to Mason et al. (2003) collaboration has historically been associated with both virtue and vice. Collaboration must be understood as a process that emerges from a networked environment. This process is explained by Himmelman (1993:1, cited by Mason et al. 2003) as follows:

- **networking** is exchanging information for mutual benefit;

- **coordination** is exchanging information *and altering activities* for mutual benefit *and to achieve a common purpose*;
- **cooperation** is exchanging information, altering activities, *and sharing resources*, for mutual benefit, and to achieve a common purpose; and
- **collaboration** is exchanging information, altering activities, sharing resources, *and enhancing the capacity of another* [individual or] organization, for mutual benefit, and to achieve a common purpose.

The primary focus of a multi-stakeholder partnership in collaborative e-skills ecology is to deliver on e-skills to communities that are appropriate to their needs (NeSPA, 2010). A primary objective of the NeSPA (2010) based policy-making is to develop, deploy and redevelop e-skills applications in the light of local experience and context.

2.2.8 Excellence education for all as the policy-making aspect

According to Wilensky (1975:3) *“A nation’s health and welfare effort is clearly and directly a contribution to absolute equality, the reduction of differences between rich and poor, young and old, minority groups and majorities; it is only a secondary contribution to equality of opportunity. In contrast a nation’s educational effort especially at the higher levels, is chiefly a contribution to equality of opportunity-enhanced mobility for those judged to be potentially able or skilled; it is only a peripheral contribution to absolute equality”*. What Wilensky implies, according Busemeyer (2012), is that education should be assessed and analysed separately from other social policies, since its primary purpose, unlike others, is not necessarily to mitigate socio-economic inequalities. However, Busemeyer (2012) in his study among European states cautions that educational institutions, instead of creating equal opportunities, can contribute to socio-economic inequality and labour stratification.

A multi-country study involving UK, Germany, Australia, Canada, USA, France, Sweden, Denmark, Finland and Italy reveals how educational inequalities have an impact on education and economic mobility (Sutton Trust, 2011). This study raises concern that may provide lessons to developing countries like South Africa. The study measured how parents’ education or family background has generational

outcomes that impact on child mobility opportunities. The study reveals the following set of findings:

- children from less advantaged families are slower in their uptake to school readiness, which is also reflected in their cognitive and socio-behavioural outcomes;
- the role of preschool education (of between 2-3 years instead of only one year) can have lasting effects on children up to adulthood as catalyst in reducing educational and economic disparities;
- disparities in early childhood outcomes persist through adolescence, up to university age and even beyond; and
- in England alone, the achievement gap between less advantaged children and more, the more advantaged widens between the ages of eleven and sixteen;

What these findings suggest is that family background, especially with respect to parents with low levels of education, impacts children from an early life and persist into adolescence and beyond. However, besides family backgrounds, environment factors such as cultural, economic, educational aspects particular to each country invariably impact attainment gaps and mobility. The study sought to prove that higher inequality does reduce the capacity to equality of opportunity and intergenerational mobility. This study has relevance for South Africa, given its gap between rich and poor and especially the impacts on an individual's skills mobility chances.

Forecasts predict that by 2015, 90% of jobs will need at least basic computer skills if workers want to remain employable. As ICT are used to displace routine jobs, other jobs are more complex and demand more ICT knowledge. Yet ICT training programmes at universities are lagging behind the fast-moving pace of technology development (European Commission, 2012). According to the Benton Foundation (2000, cited in iSkills, 2007) *"...while installing hardware and wiring is a necessary step toward ensuring that all students benefit from the new learning opportunities of the information age, it is not sufficient to guarantee success in this endeavour. To sustain public support...we must document progress toward achieving them.*

Moreover, we must provide sustained and creative training opportunities for teachers so that they learn how to use these new tools effectively”.

Garrett & Campbell (2010) underline the critical role of education. A study among 14 OECD countries found that *“a 1% point increase in the school enrolment rates tends to generate economic growth of up 3% points; an additional year of secondary level education for the population as a whole would have the impact of raising economic growth by an additional 1% point per year; and a 1% increase in literacy scores...relative to the international average is associated with an estimated 2.5% relative rise in labour productivity and a 1.5% rise in GDP per head”* (Coulombe et al., 2004, cited in Garrett & Campbell, 2010). However, Hanushek and Woessmann (2009: 28, cited in Garrett & Campbell, 2010) suggest a balanced approach to skills development since evidence shows *“that both providing broad education – education for all – and pushing significant number to very high achievement levels have economic payoffs”*. In terms of wage earnings, the computing skills index ranging from simple, moderate, advance to complex rate per unit increase as estimated at 5.3% to 6% for men and women respectively. For instance a woman with complex computer skills will on average earn 24% more than a woman working a similar job that does not require computer skills (Green et al., 2007, cited in Garrett & Campbell, 2010).

An e-Education White Paper (South Africa) was adopted in 2004 with policy goals that every learner from primary to secondary school should be ICT literate by 2013 (Isaacs, 2007). The White Paper defined e-education as being broader than developing computer literacy skills, and skills necessary to operate various types of ICTs. It is also the ability to:

- Apply ICTs, access, analyse, evaluate, integrate, present, and communicate information;
- Create knowledge and information by adapting, applying, designing, inventing, and authoring information; and
- Function in a knowledge society by using appropriate technology and mastering communication and collaborations skills (Isaacs, 2007).

According to Schmidt et al. (2008) students who come from tertiary education have a higher degree of e-skills, than those coming from secondary education. The same applies to those who have access to Internet at work, than those who access it from elsewhere.

The OECD (2007: 121, cited in Garret and Campbell, 2010) makes a strong case for the role of education: “...the evidence presented makes a strong case for the positive role of education. In some respects, the evidence is strong enough for a causal relationship to be accepted on any reasonable standard. It is also explained that education affects people’s lives (directly and indirectly) and that, overall, more education is likely to improve learners health, and their capacity and motivation to participate in civic and social life. Here cited OECD report stresses that education *contributes* effectively to cost containment in public services. In other words, education should be viewed as an investment that saves money and enable people to more effectively use public services. Hence, education can generate (or maintain) well-being and contribute to the quality of life. The table below (Table 3) gives a display of the wider benefit of education described above.

Table 3: Wider benefits of learning (Source: OECD, 2007)

| | Private | Public |
|---------------------|--|---|
| Monetary | <ul style="list-style-type: none"> • Earnings • Income and wealth • Productivity and profitability | <ul style="list-style-type: none"> • Tax revenues • Employment • Health costs • Reduced crime |
| Non-monetary | <ul style="list-style-type: none"> • Health status • Life satisfaction • Reduced crime • Individual well being | <ul style="list-style-type: none"> • Social capital • Social cohesion • Social trust • Well-functioning democracy • Political stability • Child poverty |

Kozma (2009, European Commission) states that while changes have occurred in the economy, work and in society, educational systems worldwide experienced limited changes to keep pace with changes in those sectors. Changes that occurred in the economy and work sectors include:

- the *restructuring of economies* - the shift from an economy based on material goods and services to one based on information and knowledge;

- *restructured work* - “organisational structures have become flatter, decision making has become decentralised, information is widely shared, workers form project teams...and work arrangements are flexible;
- *enabled by ICT* - these organisational changes to structure and practices are the impacts of ICTs on communication, information sharing and business processes; and
- *requiring of new skills* - with these changes to organisational structures, companies are changing their practice in hiring people and the skills that are needed.

Major changes that occurred in society include: widespread access to ICT and new patterns of information use. However, very little changes have occurred in the education sector, thus prompts the e-skills policy-making implications: “*while people outside of school work flexibly in teams, use a variety of digital tools and resources to solve problems and create new ideas and products, students in schools meet in structured classrooms at specified times; teachers cover the standard content by lecturing in front of class while students listen; students work individually and reproduce this knowledge on assessments; and their use of ICT is limited*” (Kozma, 2009).

2.2.9 A future oriented perspective to guide e-skills preparedness and development

According to a report by the European Commission (2010) people need to be prepared with skills for the future as the times we are living in are undergoing accelerated change. Employing a foresight methodology to develop visions and scenarios of future competences, the report highlights certain key areas that will need attention. Formal education and training in 2020-2030 will be affected in the following ways (European Commission, 2010):

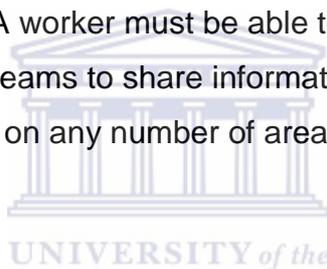
- Future school education: Although schools in 2025 will remain the main provides of learning for the young generation, learning will become more flexible catering to pupil needs, and integrate external learning resources and practical learning.

- Teachers and trainers: Teaching practice will become more self-regulated, collaborative and personalised; they will not be replaced by ICT but will be actively engaged in the learning process.
- Early school leaving: Early school leavers will be able to re-engage in educating themselves, as more learning opportunities become available through technological innovation and mechanisms that support recognition of informally acquired skills.
- Inclusion and social integration of migrant children: Technology will play an important role in multi-cultural learning environments, helping children to learn new languages and adapt to cultures and to develop a cohesive identity within the cultural mix.
- Future training strategies for employment and career development
- Entering the labour market: Although the current gap between formally acquired skills and competences and labour market needs will continue to widen, the role of education and training institutions will be to engage in dialogue with industry and adapt their curricula and syllabi accordingly, while labour markets on the other hand will start to implement their own testing and training schemes.
- Re-entering the labour market: In future more and more people will enter the job market without having relevant formal qualifications. The relevance of practical skills training, and recognition of prior learning, will be as important to help people entering a new career path.
- Re-skilling those who have low qualifications: Experts are of the view that while the lowly qualified should aim to attain formal qualifications to gain employment, those with informally acquired skills will be better recognised and that mechanisms will be put in place to further develop the expertise of their acquired skills.
- Re-skilling later in life: Irrespective of one's skills levels, it is believed that life-long learning remains vital to avoid the obsolescence of current expertise.
- Career development and professional relationships: It is believed that in future professional relationships will change as hierarchies between older and younger workers will flatten, and that training needs will be exercised in an open and collaborative manner.

According to Davies et al. (2011) the relevant skills for the future stretching for at least the next decade will mean that individuals will have to continually reassess the skills they have over what they need. It is believed that workers will need to be adaptable and be prepared for lifelong learning. Garrido et al. (2012), state that beside ICT competence, additional skills required within the labour market include communication skills, team work, collaboration, critical thinking, decision making and general social skills. It is within this environment that those who are unemployed and are older workers will fall prey because of skill obsolescence than other groups. This is supported by Davies et al. (2011) who highlight relevant skills going forward to include:

- **Sense-making:** These are skills that machines are not able to do such as the ability to apply critical thinking when situations require.
- **Social intelligence:** machines have limited capabilities when it comes to the wide range of social skills such as to connect with people at deep emotional level, and to collaborate and develop relations based on deep levels of trust.
- **Novel & adaptive thinking:** It is the ability to respond to unique and unexpected circumstances as they arise. These skills will become more pronounced in the future as a result of automation and rise in offshore opportunities. The continued job opportunities are available at the high-end technical and management levels, and at the lower-end low skill and low wage levels, and workers to remain employable be aware of trends emerging in the market be able to adapt accordingly.
- **Cross-cultural competency:** Organisations are increasingly adapting to cultural diversity and being adaptive to new contexts and acquiring added linguistic skills will aid the worker when opportunities avail themselves.
- **Computation thinking:** These skills are required especially in decoding the vast amount of data that is captured and which requires creating meaning of all the information. The harnessing of skills such as computer languages, statistical and quantitative reasoning will be of significant value.
- **New-media literacy:** The next generation of workers must be literate in video production, have the ability to present visual content, keeping abreast of all developments in new media formats.

- **Transdisciplinarity:** the ideal worker is the one who is “T-Shaped” meaning he/she has deep knowledge of at least one field, but adequate knowledge to be conversant across other disciplines.
- **Design mindset:** Motivation and inspiration are brought upon by a number of elements or factors associated with context, environment etc., influencing emotions or mood. An example is highlighted where, depending on the height of a room’s ceiling, persons either feel unrestricted or free if a ceiling is high, whereas those with lower ceilings feel confined. Workers of the future need to be adept at reorganising the kind of thinking required and readjust their environments to achieve best results.
- **Cognitive load management:** There is a constant flow of rich information streaming across all mediums, and workers will need to be adept at using tools to filter the vast flow of data.
- **Virtual collaboration:** A worker must be able to use connective technologies to collaborate in virtual teams to share information, and create virtual presence for interaction on any number of areas of interest (Davies et al., 2011).



Although these skills cover a wide area of expertise, the link with ICT in the future is taken for granted, as such e-skills policy ought to have a future oriented focus to apply its own adaptive strategies when required to face future challenges. Tella & Olorunfemi (2010) strongly believe that “*enhancing the future ICT connectivity in the developing world is sine-qua-non to sustainable global development*”. In that regard, they suggest that, to achieve the above, “*governments and other stakeholders need to design and implement effective ICT strategies, the new technologies and services may help to reduce the gap for some disadvantaged or marginalized people*”. Hence, Tella & Olorunfemi (2010) believe that strategies and policies in ICT-related skills development need to focus on future capabilities for using ICT in ways relevant to development priorities. Complementary to the above discussion is a need to continuously provide ICT teachers and trainers with skills about new (future) technologies in order for the skilling process to bring benefits in this fast changing technological environment (Romeo et, al., 2012).

2.3 E-skills policy framework in South Africa: a conceptual proposal

As countries increasingly recognise the importance and value of e-skills for individuals and society, development of sustainable e-skills policies are highly important. Singh (2012) believes that there are number of policy conclusions that can be drawn on how to bridge the gap between demand and supply of e-skills (in Europe, but possibly elsewhere as well):

- **First**, e-skills should be viewed as long term policy agenda with on-going consultation, monitoring and evaluation of processes, involving the various stakeholders;
- **Second**, establishment of a centre offering ICT certification to maintain high standards of ICT skills and attainment;
- **Third**, government must continue in e-skills development to keep up with changes in technology;
- **Fourth**, an increase in the output of computer science, mathematics and engineering education;
- **Fifth**, stimulating fiscal investment in providing grants, scholarships for e-skills development;
- **Sixth**, to generate continuous awareness among the people about the need of e-skills;
- **Seventh**, government should ensure commitment to institutional structure and support through necessary legal and financial framework; this will sustain multi-stakeholder interest and motivation;
- **Eighth**, exchange of ICT expertise among sectors; and
- **Ninth**, keep a good record of common data, and have a good understanding and knowledge of the issues relating to e-skill.

Malek et al. (2012) drawing on the digital inclusion concept of Heeley and Damodaran (2009) propose a hierarchical framework to indicate a progression of steps toward digital inclusion:

- **Level 1**: deployment of ICT infrastructure;
- **Level 2**: digital awareness projects (strong drive of ICT adoption);
- **Level 3**: development of 'know how', IT skills development;

- **Level 4:** digital opportunity (socio-economic impact of ICT); and
- **Level 5:** digital empowerment-innovative designs tailoring technology to meeting needs (value creation).

Based on the reviewed literature this study has identified certain key aspects that can influence the formation of an e-skills policy framework. One of the issues that was raised is to be aware of human social values when making meaning and sense about ICT in human life. Foley et al. (2002) refers to it as the user-focused perspective as essential for effective policy development and desired impact. The e-SI in its value proposition booklet has warned of the consequences of a technocratic approach grouping South Africa among those who are on a downward slide of e-readiness. What also needs to be taken into account is the complex process in developing policy, and its uneasy relationship with research-related solutions. The literature highlights that policy-makers have a tendency to overlook research findings, even if the research has been commissioned by these very policy-making institutions. Suggestions have been made by the S.A. Presidency survey (2012), that to overcome barriers to policy is to improve, among others, (i) evidence-based research and (ii) enhance monitoring and evaluation capacity.

E-skills have been shown to contribute great benefits and opportunities for individuals and society. NeSPA (2010) promotes the idea of e-skilling to increase the competitiveness and prosperity of the nation. It is this focus on benefits and related impact that Foley et al. (2002) believe will make effective policies. Once people understand the benefits of ICT to their lives, will they be encouraged to make better use of it. Research is therefore an important component to understand the way human behaviour impacts on ICT adoption and usage.

Much attention should be given to develop an e-inclusion society. E-inclusion should form the foundation upon which to build an e-skills policy framework. A key focus, which according to Wilensky (1975:3, cited by Busemeyer, 2012) should be assessed and analysed separate from other social policies, is education. A nation's wellbeing, future and innovative capability are strongly connected to excellence of its education.

The role of multi-stakeholder relations or a collaborative e-skills ecology supported by good leadership and motivated by sustainable initiatives is critical for an e-skills policy framework, as put by the e-SI newsletter (December, 2012: 3): “*multi-stakeholder collaboration has become the de facto way forward to ensure alignment with stakeholder needs and national goals as well as increased impact*”.

The future of e-skills policy development will depend on forecasting and a future-orientated perspective and research emphasis to keep abreast on new developments and scenarios relevant for the South African society.

The reviewed literature has shown that the notion of e-skills has many facets and can be explored from many viewpoints. Based on the analysis of the “best practice” for the commonalities in various theories and models shown in the reviewed literature, this study suggests the following elements for building the framework for e-skills policy-making in South Africa:

- **Context-related awareness;**
- **Collaborative e-skills ecology;**
- **Excellence education for all;**
- **Futures of ICT capabilities and knowledge infrastructure;**
- **Research and development;**
- **Cost and affordability;**
- **E-inclusion**-this forms the underlying foundation upon e-skills policy framework should be built; **and**
- **Monitoring and evaluation.**

Table 4 (below) shows the identified e-skills policy-making elements related to the referenced sources:

Table 4: e-Skills policy-making elements related to the referenced sources (Source: Author)

| e-Skills policy element | Reference |
|---------------------------------------|---|
| Context-related awareness | Foley et al., 2002; Adam et al., 2007 Romani, 2009; Ala-Mutka, 2011; Singh, 2012; Naidoo et al., n.d; |
| Collaborative e-skills ecology | Sellen et al., 2009; Merkofer et al., 2009; NeSPA, 2010; MIT Press, 2000; Brown & Lautenbach, n.d ; |
| Excellence education for all | Wilensky, 1975:3; iSkills, 2007; Hanushek & Woessmann, |

| | |
|---|--|
| | 2009; Garrett & Campbell, 2010; Sutton Trust, 2011; Busemeyer, 2012; Busemeyer, 2012; |
| Futures of ICT capabilities and knowledge infrastructure | Walt, 2005; Adam et al., 2007; Isaacs, 2007; IDRC, 2008; Kozma, 2009; Hearn & White, 2009; Mitrovic, 2010; NeSPA, 2010; Ala-Mutka, 2011; Davies et al., 2011; ISETT SETA, 2011; Mitrovic et al., 2012; Singh, 2012; DAE, 2013; |
| Research and development | Foley et al., 2002; Van Dijk, 2005; Adam et al., 2007; Lupac & Sladek, 2008; Vanska et al., 2008; Alexander et al., 2009; NeSPA, 2010; Mitrovic et al., 2012; de Villiers et al., 2012; DAE, 2013; |
| Cost and affordability | Foley et al., 2002; OECD, 2007; Schmidt et al., 2008; ISETT SETA, 2011; Garret and Campbell, 2010; Gomez, 2012; |
| E-inclusion | Foley et al., 2002; Sen, 2000; Zheng & Walsham, 2008; Damodaran & Heeley, 2009; Heeley & Damodaran, 2009; European Commission, 2010; Nash, 2011; S.A Presidency, 2012; Malek et al. 2012.; European Commission, (Granada), 2012; |
| Monitoring and evaluation | Young & Mendizabal, 2009; NeSPA, 2010; S.A Presidency, 2012; Singh, 2012; Mitrovic et al., 2012; |

Figure 12 below shows the diagrammatical representation of the proposed e-skills policy-making framework:

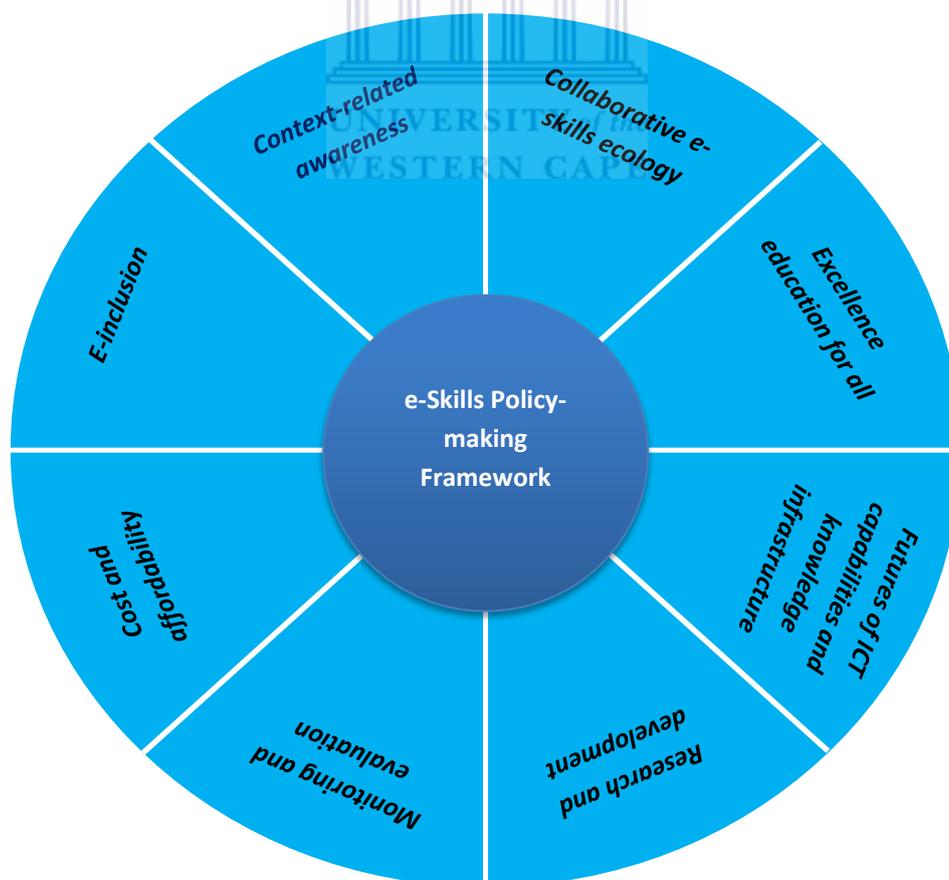


Figure 12: Conceptual framework for e-skills policy-making (Source: Author)

2.3.1 Summarised description of the elements of e-skills policy-making conceptual model

This section brings summarised description of the proposed e-skills policy-making conceptual model derived from the reviewed contemporary literature.

2.3.1.1 Context-related awareness

e-Skills policies and educational approaches should aim to provide awareness and learning opportunities for all and to generate continuous awareness among the people about the need of e-skills. In order to achieve the right policy impact, it is important to undertake research into ICT awareness to establish: (i) awareness of the ways in which ICT can be used in everyday life and work; (ii) awareness of ICT access and availability; and (iii) awareness of ICT impact and benefits. It is also advised that policy-makers and other key role players must create mechanisms to develop and monitor awareness and encourage all key stakeholders to participate.

The e-skills related awareness can be developed *inter alia* through collaborating with the media and the digital awareness projects.

2.3.1.2 Collaborative e-skills ecology

As ICT research and design takes increasing account of human values, the role of policy-makers in ICT become more collaborative through interdisciplinary exchange. This practice is notably confirmed in the South African e-skills context in which the multi-stakeholders collaboration is one of the cornerstones of success. In that regard, the primary focus of e-skilling is to engage with a wide network of stakeholders through the “*collaborative network architecture*” to develop collaborative and integrated national policies aimed at achieving desired impact. The reviewed literature strongly suggests that the personal opinions, corporative interest, lobbying, ideological values and other “non-measurable” factors can only be captures during the interaction of stakeholders and policy-makers interact within social networks. These factors, which are not research obtained, often prevail on the scientific evidence.

The role of multi-stakeholder relations or collaborative e-skills ecology, supported by good leadership and motivated by sustainable initiatives, is critical for an e-skills policy framework.

2.3.1.3 Excellence education for all

The reviewed literature shows that skills development through “*education for all*” have economic payoffs as, for example, forecasts predict that by 2015, 90% of jobs will need at least basic computer skills if workers want to remain employable. As ICT are used to displace routine jobs, other jobs are more complex and demand more ICT knowledge. In terms of wage earnings, the computing skills index ranging from simple, moderate, advance to complex rate per unit increase as estimated at 5.3% to 6% for men and women respectively.

However, despite major changes that occurred in society and economy, which include widespread access to ICT and new patterns of information use thus requiring new skills, the ICT training programmes at educational institutions are lagging behind the fast-moving pace of technology development. The review literature also warns that non-inclusive education and limited changes in educational systems worldwide, instead of creating equal opportunities, can contribute to socio-economic inequality and labour stratification. Hence, e-skills policies should support and take into account excellence education for all.

2.3.1.4 Futures of ICT capabilities and knowledge infrastructure

Walt (2005) believes that theory can assist policy-makers in prediction, i.e. it can help policy-makers in anticipating outcomes or events since good theories are able to identify central causal factors so that the policy-makers can have a better understanding of the broader context of the phenomenon they face. From this study viewpoint, it is particularly important to identify how future appropriation of ICT can affect social and economic progress (Adam et al., 2007; Isaacs, 2007). This is highly relevant for continuous use of ICT in order to adequately participate in an environment increasingly dominated by access to electronically enabled information and a well-developed ability to synthesise this into effective and relevant knowledge. According to Davies et al. (2011) the relevant skills for the future stretching for at least the next decade will mean that individuals will have to continually reassess the skills they have over what they need. It is believed that workers will need to be adaptable and be prepared for lifelong learning.

This knowledge, linked in an appropriate infrastructure, is particularly important in developing countries as it is base to achieve sustainable-development goals (IDRC, 2008). Kozma (2009) states that, while changes have occurred in the economy, work and in society, educational systems worldwide experienced limited changes related to keeping pace with changes in those sectors – indicating that knowledge must be integrated, i.e. networked. The importance of the collaborative approach to policy-making also confirms the latest thinking in the European Union. The personal opinions, corporative interest, lobbying, ideological values and other “non-measurable” factors can only be captures during the interaction of stakeholders and policy-makers interact within social networks. These factors, which are not research obtained, often prevail on the scientific evidence (DAE, 2013)

2.3.1.5 Research and development

The research and development component of policy-making is frequently (explicitly and implicitly) mentioned throughout this thesis. The principally important in the domain of policy-making is the fact that the knowledge gained by research is often isolated from the policy-makers and practitioners in the field - instead to be used for informing policies (Bird et al., 2004). This was the reason for Foley et al. (2002) state that to achieve the right policy impact, it is important to undertake research. That was also the reason for Hearn & White (2009) to call for more effective bridges between knowledge, policy and practice. Alexander et al. (2009) confirm that researchers experience a number of methodological challenges in undertaking e-skills research in South Africa, such as absence of certain critical research elements (de Villiers, et al. 2012).

In the context of this study, e-skills should be viewed as long term, developmental policy agenda with on-going consultation, monitoring and evaluation of processes, involving the various stakeholders (Singh, 2012). This is supported by Van Dijk’s (2012) view that mitigation against inequalities of the digital divide and digital skills can be done by developing deliberate policies.

However, as indicated in de Villiers et al. (2012), still insufficient success to redress e-skills remains. One of the concerns raised by Merkofer et al. (2009) regarding the adequate analyse, evaluation and forecast future demands for e-skills in South

Africa, was the different definitions and conceptualisations used by government and the research institutions in describing e-skills.

2.3.1.6 Cost and affordability

South Africa is currently facing a number of serious challenges that are hindering national efforts aimed at an appropriate use of ICT for the socio-economic prosperity of its people. Among other reasons, the high costs of insufficiently developed ICT infrastructure resulting in poor rates of ICT usage (NeSPA, 2010). Foley et al. (2002) also suggests that costs are one of barriers that impact adoption and use of ICT among those classified as socially excluded. Hence, the South African Department of Communications published its commitment to universal service and access, which stated that universal access is provided where *all persons in all areas and communities* are able to obtain quality, affordable and usable access to a publicly available minimum set of quality electronic communications network service and electronic communications service (Gomez, 2012).

Foley et al. (2002) maintain that ICT users believe access is the most important to encourage ICT adoption, while for non-users, to encourage ICT adoption was not access but training coupled with low cost. Schmidt et al. (2008) highlight that the role of a competitive ICT sector with a proper regulation environment can, besides driving down cost to ensure wider access and usage, will encourage sustainable ICT development which in turn impact on economic development and growth.

Hence, NeSPA 2010, drawing on the “best practice”, suggested development of a proposal to examine a national transfer pricing model to provide a level of free cell phone and Internet access cf. Electricity and water.

2.3.1.7 E-inclusion

The reviewed literature *inter alia* pointed out a significance of the role of the notion of e-Inclusion as the foundation of e-skills policy framework. It seems that the modern literature pays much attention to a question of how does one proceed from a socially excluded e-society to an e-inclusive one (e.g. Sen, 2000; Zheng & Walsham, 2008; Foley et al., 2002). According to the pertinent literature, e-inclusion should form the foundation upon which to build an e-skills policy framework with a key focus on education (e.g. Wilensky, 1975:3; Busemeyer, 2012). A nation’s well-being, future

and innovative capability are strongly connected to excellence of its education through *inter alia* notion of E-inclusion.

2.3.1.8 Monitoring and evaluation

In order to adapt and improve policy processes and policies, the S.A Presidency (2012), given the complexity and dynamism of the majority of policy contexts in South Africa, suggested that monitoring and evaluation be used for gathering substantive evidence derived from this E&M or M&E process. In that regard, e-skills should be viewed as long term policy agenda with on-going consultation, monitoring and evaluation of processes, involving the various stakeholders.

Young & Mendizabal (2009) believe that an appropriate M&E will balance the current approach in which much space in the policy development is left to the policy-makers own values, experience, expertise, judgement, the influence of lobbyists and pressure groups, pragmatism, or based on the resources available, than on evidence. Keeping a good record of common data, and have a good understanding and knowledge of the issues relating to e-skill will help to bridge the gap between demand and supply of e-skills (Singh, 2012). The South African e-skills agenda, being still relatively new, needs an appropriate foundation for decision-making and that foundation is seen as evidence-based policy-making (Mitrovic, 2010).

2.3.2 Fitting into the policy-making process

As mentioned in section 2.1.4 Policy-making processes: the contemporary thinking, it will be useful to position the Conceptual framework for e-skills policy-making (Table 4 and Figure 12) within the policy-making processes. This is shown in Figure 13.

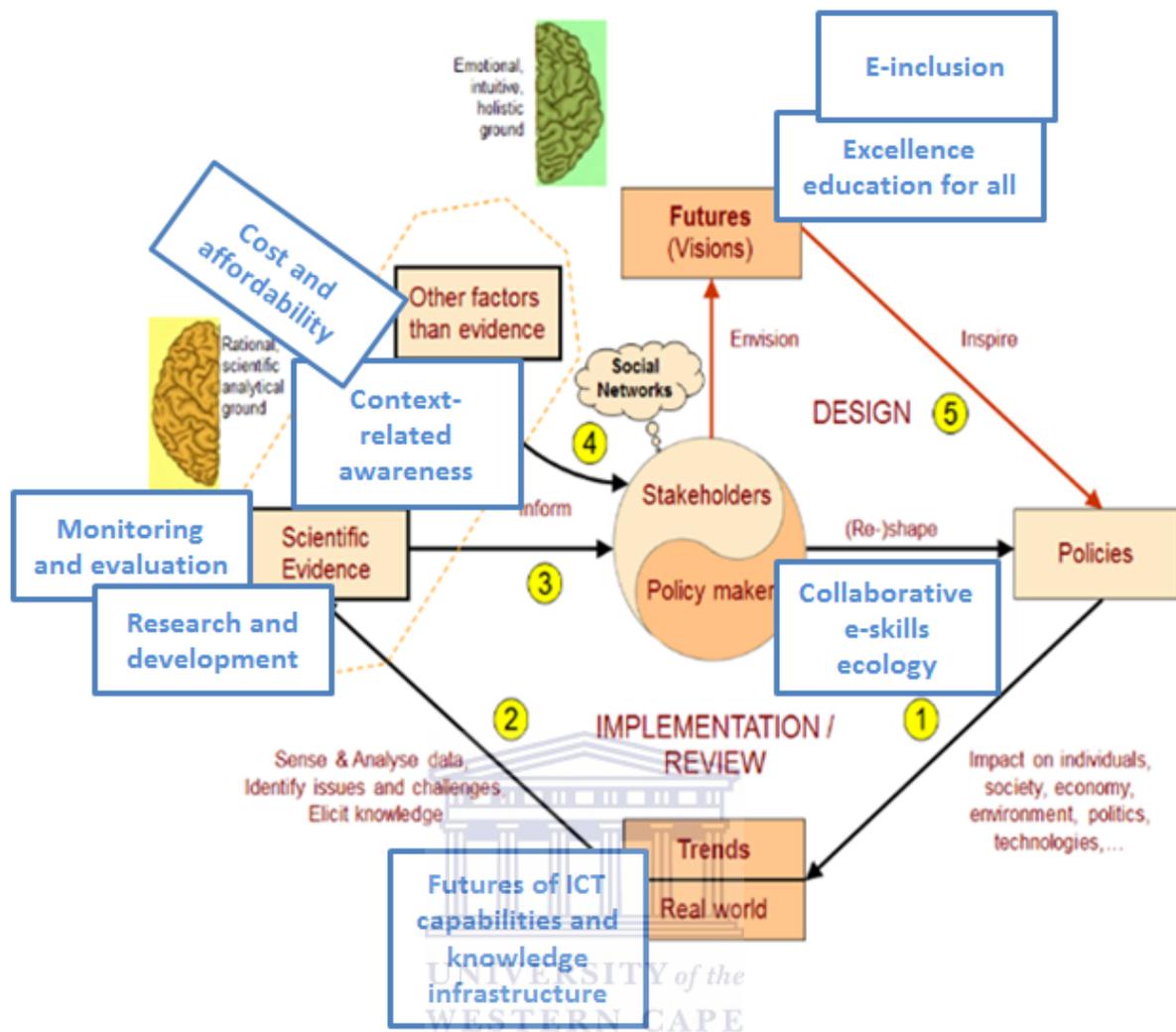


Figure 13: The position of the Conceptual framework for e-skills policy-making elements within the policy-making process model (Source: author, based on DAE, 2013)

The elements “Monitoring and evaluation” and “Research and development” of this study’s Conceptual framework for e-skills policy-making can be mapped to the “Scientific Evidence” of the Policy making 3.0 framework, as they are self-evidently related. The element of “Contextual-related awareness” is positioned between “Scientific Evidence” and “Other factors than evidence” as the contextually-related awareness can be scientifically measured but also depends on many other factors (e.g. awareness campaigns or political influence). Similar case is with the “Costs and affordability” element.

“E-inclusion” and “Excellence education for all”, in the South African context, clearly belong to the “Futures (Vision)” element as they are still to be achieved. The “Collaborative e-skills ecology” indicates collaboration between the policy-makers

and other e-skills stakeholders (e.g. government, education, business, civil society organisations, as outlined by NeSPA, 2010) and here is, hence, associated with the networked “Stakeholders Policy makers”. The “Futures of ICT capabilities and knowledge infrastructure” is here associated with the Policy making 3.0 element “Trends/Real world” as understanding and exploiting future capabilities of ICT is of the vital importance for creating and use of the knowledge infrastructure that will impact (actually, is already impacting) the real world.

2.3.3 Testing elements of e-skills policy-making conceptual model

This conceptual framework for the e-skills policy-making was subsequently tested in the empirical setting that encompasses e-skills experts (researchers and practitioners), policy-makers, political leaders and strategy and policy-makers from the industry, education, government and civil society. The conceptual framework and its elements described through this chapter were the bases for constricting the interview questions to the mentioned sample. The next section, thus, brings a discussion regarding the research design for this study, available methodologies and the method of choice that guided the data collection and analysis in this research.



CHAPTER 3: RESEARCH DESIGN AND METHODOLOGY

This chapter brings a brief theoretical discussion about methodology, methods and techniques in order to avoid possible confusion of terms. This is followed by the description of the selected methodology for this study, the steps taken in this research (research design) and the application of the selected methodology as well as some research validation remarks.

3.1 Semantic clarification of the research terms

Considering the level of complexity of the methodological dimension of research, Mouton (1996) defines the three concepts, i.e., methodology methods and research techniques, as follows:

- **Methodology:** At the highest level of the research conceptual complexity is the methodological paradigm. This level encompasses the actual methods, techniques and the underlying philosophy. Hence, Mouton suggests that the research methodology be defined as a collection of research methods, techniques, assumptions and values regarding their use under specific circumstances.
- **Methods:** The term “method” refers to a higher level of abstraction, as far as the means of research is concerned and is, by Mouton, described as the “class and cluster” of techniques. A research method, thus, refers to the means needed for execution in a certain stage in the research processes.
- **Techniques:** The least complex and the most concrete level is referred to as research techniques. These are usually applied within a research instrumentation which includes the techniques, procedures and skills. In that regard, the research techniques are the specific and concrete means that a researcher uses to execute a specific research task.

These terms will be used in this study in the above meanings.

3.2 Philosophical perspective

The notion of the research methodology, being a collection of research methods, usually divides these methods in *qualitative* and *quantitative*. Quantitative research methods were initially developed in the natural sciences in order to study natural

phenomena. This group of research methods uses the quantifiable (numerical) data in order to understand the studied phenomena. On the other hand, the Qualitative research methods are designed to help researchers understand people and the social and cultural contexts within which they live. This group of methods uses description and interpretation of the studied phenomena rather than quantification. There is, however, a “third way”, i.e. the combining one or more research methods in one study. This “mixed” research methodology is also called “*triangulation*” (e.g. Hackney, 2000).

Another possible classification from a philosophical perspective distinguishes between *semiotics*, *narrative and metaphor* method, and *hermeneutics* (Hackney, 2000). *Semiotics* is primarily concerned with the meaning of signs and symbols in language. *Narrative and Metaphor*, in short, focuses on understanding of language, communication and meaning. *Hermeneutics*, on the other hand, is primarily concerned with the meaning of a text or text-analogue. This philosophical perspective is often linked to the phenomenology, considering them as the philosophical base of *interpretive* research. Since the hermeneutics is the selected philosophical approach of this study, it will be explained in some more detail in the following section.

3.3 Hermeneutics, phenomenology and interpretivism

Hermeneutics is primarily concerned with the meaning of the text or text-analogue. The idea of a hermeneutics circle refers to the dialect between the understandings of the text as a whole and the interpretation of its parts, in which the description is guided by an anticipated explanation (Gadamer, 1976). An example of a text-analogue is oral or written text that is analysed for a meaning. In this study, the hermeneutics is used to “circularly” understand the reviewed literature and the interviews of the participants in this study.

As stated earlier, hermeneutics is often associated with the phenomenological paradigm, which is concerned with the human consciousness in social practices. This encompasses speech, action and work associated with the human consciousness. In this research, the phenomenological approach is used to understand the human actors (interviewees) from the viewpoint of their own

interpretations of reality regarding the way the policy (particularly e-skills policies) should be developed.

Hermeneutics and phenomenology are traditionally associated with the qualitative approach and the interpretive methods as that interpretive understanding requires a methodology that emphasizes qualitative analysis through unstructured and open interviewing, idiographic and “thick” descriptions (Mouton, 1996). Hermeneutics has a relatively stable philosophical base and “*is used as a ‘bridgehead’ for making a contribution to interpretive research methodology*” (Klein & Myers, 1999). Using anthropology, phenomenology, and hermeneutics, Klein and Myers (1999) have developed the set of principals conducting and evaluating interpretive field studies in information systems, which is the closest discipline to the emerging e-skills field of research.

Discussing the research philosophical paradigms cannot be complete without considering the underlying epistemology (Hackney, 2000; Clarke, 2000). Mouton (1996) deems that there are interchangeably used terms that refer to the critical reflection on the nature of a scientific enquiry: “*metatheory*”, “*philosophy of science*” and “*epistemology of science*”. Epistemology, in that regard, is understood as the assumptions about knowledge and how it can be obtained (Chua, 1986; Orlikowski & Baroudi, 1991). These are the main epistemological approaches:

- **Positivist approach:** Considers evidence of formal propositions, quantifiable measures of variables, hypothesis testing, and the drawing of inferences about a phenomenon from a representative sample to a stated population (Klein & Myers, 1999).
- **Critical approach:** The main task of critical research is seen as being one of social critique. Critical research focuses on the oppositions, conflicts and contradictions in contemporary society, and it should help to eliminate the causes of separation and domination (Hackney, 2000).
- **Interpretive.** Interpretive studies generally attempt to understand phenomena through the meanings that people assign to them (Walsham, 1995). The nature of the research problem and, consequently, research question in this

study strongly suggested that the interpretivism should be selected approach for designing an e-skills policy-making framework.

Interpretive research significantly differs from other qualitative methods, as the biggest difference is demonstrated in data gathering and analysis. The conventional science is based on “*rational positivists*” thought presuming that factual, truthful and unambiguous data can be gathered by observing it. Conversely, the interpretivists believe that these assumptions are unjustifiable since the “*objective observation*” is impossible, and that the act of observation and interpretation is dependent on the perspective adopted by the observer (Clarke, 2000). The aim of the human science, believe interpretivists, is not to explain or analyse but to understand (Mouton, 1996). Here is, however, important to acknowledge that the interpretivist approach is not free of difficulties such as (i) intangibility of many of the factors and relationships, (ii) inherent involvement of the researcher within the research domain, (iii) dependence of the outcomes on the researcher’s perspective (e.g. selection and the definition of the research domain, interpretation of existing theories, definition of the research question or design of the research framework). This suggests that the research phenomena should have a multiple interpretations (Clarke, 2000). In this research it was achieved by separate and then joined (hermeneutic circle) interpretation of the approaches to the designing the e-skills policy-making framework: by the “best practice” (found in the reviewed literature) and the interviewees, which are considered as experts in the realm of either e-skills or policy-making or both.

3.4 Selected methodology

As stated earlier, from the philosophical perspective this research belongs to the large group of qualitative methods since the data is obtained by interviewing the policy-making and e-skills experts and the data analysis is done using the hermeneutics mode of analysis. Based on the underlying epistemology, this study has utilised the interpretive method that allowed the participants in this study to “*just as much as the researcher, can be seen as interpreters and analysts*” (Klein & Myers, 1999).

In its essence this study has utilised ***Interpretive Hermeneutics***, which is in more details explained in this and following sections. The application of this method shows

in the data analysis that was performed by movement of understanding from the whole (the context in which policy-making takes place and the underlining policy-making principles) to the parts (the details of the policy-making framework) and back to the whole (Gadamer, 1976; in Klein & Myers, 1999).

Interpretivism suggests that facts are produced as part and parcel of the social interaction of the researchers with the participants. Whereas the principle of contextualization places the object of study in context, the principle of interaction between the researchers and the subjects requires the researcher to place him or her and the subjects into a historical perspective (Klein; Myers, 1999). Thus the author's historical involvement in the subject is discussed in Section 1 "Introduction". However, after exploring the method of choice, the next section focuses on the "tools of research trade" i.e. research techniques.

3.5 Research Technique of Choice

The hermeneutics and phenomenology favour data collection methods like the participant's observation and interviewing, life history methodologies and qualitative content analysis and discourse analysis (Mouton, 1996). The research techniques can be distinguished on the basis of whether or not they are empirical, i.e. whether they involve observation of the "real world". Clarke (2000) gives another classification of research techniques: non-empirical techniques, scientific research techniques, interpretivist research techniques, research techniques at the scientific/interpretivist boundary and engineering research techniques. After carefully assessing the nature of this study and the available research techniques, the following were applied in this study:

- The **review** of the pertinent **literature**;
- **Interviews** that involved the recording of verbal data from interviewees, which arises in relatively unstructured interviews; and
- **Descriptive/interpretive** techniques that include self-examination of the researcher's own pre-suppositions and prejudice, and cycles of additional data collection and analysis. This approach is used for interpretation of the interviews.

3.6 Principles for interpretive field research

In order to secure credibility of this research, this author has adopted the Klein and Myers (1999) evaluation criteria for the interpretive field research. This set of principles, depicted below, is mostly applicable to the conduct and evaluation of interpretive research of hermeneutic nature, which was philosophically adopted by this study:

The Fundamental Principle of the Hermeneutic Circle: This principle suggests that all human understanding is achieved by iterating between considering the interdependent meaning of parts and the whole that they form. This principle of human understanding, which is fundamental to all the other principles, was exercised by constant consideration of the policy-making context and the framework as a whole as well as the policy-framework elements and their relationships – and *vice versa*.

The Principle of Contextualization: Requires critical reflection of the social and historical background of the research setting, so that the intended audience can see how the current situation under investigation emerged. This is achieved by permanently considering the policy development context.

The Principle of Interaction between the Researchers and the Subjects: Requires critical reflection on how the research materials (or “data”) were socially constructed through the interaction between the researchers and participants. This was done through the interaction with the interviewees in regard to the collecting and interpreting the data.

The Principle of Abstraction and Generalization: Requires relating the idiographic details revealed by the data interpretation through the application of principles one and two to theoretical, general concepts that describe the nature of human understanding and social action. This was done through conceptualisation of the interviewees’ answers and mutual interpretation.

The Principle of Dialogical Reasoning: Requires sensitivity to possible contradictions between the theoretical preconceptions guiding the research design and actual findings (“the story which the data tells”) with subsequent cycles of revision. This was achieved by avoiding “fitting” the literature review findings into the conducted interviews.

The Principle of Multiple Interpretations: Requires sensitivity to possible differences in interpretations among the participants as are typically expressed in multiple narratives or stories of the same sequence of events under study. Similar to multiple witness accounts even if all tell it as they saw it. This principle is applied through multiple view of the interviewees and this author.

The Principle of Suspicion: Requires sensitivity to possible "biases" and systematic "distortions" in the narratives collected from the participants. The application of the principle of suspicion appears to be one of the least developed in IS research literature because of considerable disagreement among interpretive researchers concerning the extent to which social research can (or should) be critical. Although it was impossible to exclude subjectivity, this author tried to avoid any biases or distorting the interviewees' responses by fitting them into predefined concepts.

In addition, Klein and Myers (1999) believe that “*each and every interpretive researcher would have to spend considerable time*” in obtaining the theoretical foundations for their research from varied literature sources. This is done by thoroughly studying the literature on policy-making.

Considering the credibility of Klein and Myers and their work reported in the “Principles for Interpretive Field Research”, the above set of principles was used as a guideline for this research.

3.7 Research design

A research design is “*a blue-print or a detailed plan for how a research study is to be conducted*” (De Vos, 1998:123). A research design is similar to an architecture blueprint. It is a plan for assembling, organising and integrating information (data),

and it results in a specific end product, i.e. research findings. Merriam (1991:6) maintains that the selection of a design is determined by how the problem is shaped, the questions it raises and by the type of end product desired.

In order to determine the most suitable framework for e-skills policy-making in South Africa, this author went through the following steps:

- Clearly determine the research problem;
- Establish the research question and sub-questions;
- Determine research objectives;
- Reweaving the pertinent literature in order to determine “best practice” regarding creation of the policy-making framework, particularly in the fields of skills development and e-skills development;
- Create the conceptual framework, based on the reviewed literature, which was subsequently tested through empirical research;
- Design the research instrument, i.e. the interview questions;
- Analyse the interview questions for patterns, which were consequently used to answer the research sub-questions and, ultimately, the main research question; and
- Write the research report, i.e. this thesis.

3.7.1 Data collection

The interviewing e-skills and policy-making experts were the main data collection technique in this study. Although some research theories suggest relatively unstructured interviews and meetings for this kind of data collection (e.g. Clarke, 2000), the interviews conducted in this study were semi-structured. This data collection strategy was adopted having in mind:

- the nature of the conceptual model (e-skills policy-making framework); and
- the strong support from the reviewed literature interviewer (e.g. Britten, 1995; Jarratt, 1996) that suggested that semi-structured interviews allow a researcher to cover a specific list of topic areas, within the time allocated to each topic area.

The interviews in this study are conducted flexibly allowing “*open structure*” as it “*ensures that unexpected facts or attitudes can be easily explored*” (Jarratt, 1996).

The illustration of fruitfulness of this approach was discovering a strong link between e-skills policies and the national (e.g. NDP⁵, MTSF) and international (e.g. WSIS, MDGs) socio-economic developmental strategies.

To secure the interviewees full participation, an introductory letter explaining what was involved and the likely duration of the interview, was sent to a potential participants also assuring the participants of the confidentiality. The research sample consisted of 10 interviews. The sample consists of the high level policy-makers from government, academia and the corporate world but also from the “closer to ground” policy-maker researchers from the parliamentary political parties and NPOs. Six of the interviewees are directly involved in e-skills strategy or policy-making whether on national, provincial or international level. However, only six of these interviewees have fully participated in answering questions while four of them partially participated answering only questions regarding the components of the literature review derived conceptual model (Table 4 and Figure 12). Since this study is about the e-skills policy-making framework and its elements, the participation of these four interviewees was deemed sufficient.

According to Mouton (1996), there are seven general categories of “units of analysis”: individuals, organizations, institutions, collectives, social objects, social actions and events, and interventions. The unit of analysis in this study, or the “object” or “entity” to which one’s conclusion ought to apply (Mouton, 1996), was a meaningful interviewees’ respond to the interview questions spanning this unit of analysis over few categories: individual, social action and events, and intervention categories.

Here, however, the author acknowledges some limitations of this data collection technique. One of the most limiting factors was the interviewees’ availabilities and the time spending for the interviews as, being experts in their fields, they were often too busy with other tasks. This sometime caused that the interviews were conducted “in chunks” also causing the repeated review of the answers and mutual analysis.

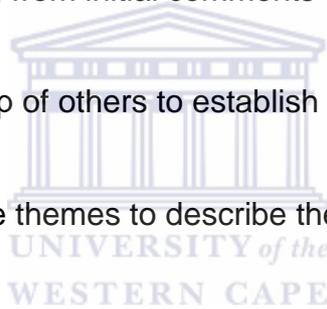
⁵ National Development Plan 2030, Presidency of South African Government

Although it initially appeared as the drawback, it has positively influenced understanding of their viewpoints regarding the interview questions.

3.7.2 Data analysis

Data analysis is, by Smith et al (2009) described as being an iterative and inductive cycle, which may involve a number of strategies:

- A line by line analysis of experiential claims, concerns and understanding of each participant;
- Identifying emergent themes;
- Coding data as a result of dialogue between researcher and participant of the meaning of aspects emerging within the interview;
- Constructing a framework illustrating relationships between themes;
- Developing a format showing the process from start to end in the development of themes, from initial comments to a final list of the identified themes;
- Collaborate with the help of others to establish coherence and plausibility of interpretation; and
- Create a narrative of the themes to describe the interpretive meanings of the data.



All of these strategies are, to some extent, applied in this study, as explained in this section.

Clear distinction between data gathering and data analysis is commonly made in quantitative research but such a distinction is problematic for many qualitative studies. This appeared to be true for this study as the *hermeneutics*, a method that was adopted by this study, was treated as both an underlying philosophy and as a specific mode of analysis –as suggested by Hackney (2000). However, Hackney cautions that hermeneutics also assumes that the researcher’s presuppositions affect the gathering of the data, as the questions posed on interviewees largely determine what the researcher will discover since the analysis affects the data and the data affects the analysis in significant ways. As Mouton (1996) put it, in the final analysis it is questioned how explicitly or implicitly the researcher reflects on his or her research practice. In that regard, this author tried to secure elimination or

minimal presupposed involvement by, for example, avoiding suggestive questions. Although this author was the one doing the analysis, it is important to state that the understanding regarding validity of the e-skills policy-making framework remained with the interviewees who are experts in the field (Geven et al., 2006).

This study tried to fully adopt the idea of the *hermeneutics circle* that refers to the dialectic between the understanding of the problem as a whole and the interpretation of its parts. In this study the process of interpretation moves from the understanding of the parts i.e. the elements of the e-skills policy-making framework, to the whole i.e. the influence and possible impact that the policy-making (using this framework) might have on the socio-economic development (spelled through the national and international developmental programmes and strategies supported by e-skills policies). The process again went from whole to the parts ultimately ending into final interpretations the interviews.

In terms of the interpretation of data, this study applied the inductive reasoning, by scanning the detailed field of information, then move toward more abstract generalizations and ideas or themes (Neuman, 1997). The understanding of this, the author was that, in the final analysis, it is the detailed interpretations of the interviews' transcripts led to the establishment of generalisations regarding the validity of the conceptual e-skills policy-making framework instituted after reviewing available literature (see, for example Geven et al., 2006).

This author followed a number of stages in analysing the interviews. As Smith et al, (2009) suggested, the initial stage was to read and re-read the individual transcript. This stage placed the interviewees in the analysis focus while this author tried to make conceptual sense of the answers. The next stage of the analysis brought a more detailed examination of the semantic issues (e.g. content and language usage). In this stage, the author attempted to understand the way the interviewees thought, talked and understood the particular issues related to the e-skills policy-making framework. This allowed the author to engage with the hermeneutics cycle by analysing the language and thoughts in order to identify the conceptual constructs for building the e-skills policy-making framework presented in this study. The third stage of the analysis in this study included working through a large set of data that

was the bases for the emerging themes related to the policy-making framework. At this stage, the interrelationships, connections and patterns in regard to the emerging concepts were identified and mapped. The next (fourth) stage of the analysis was to create connections across the relevant themes in order to establish structure of the salient aspects of the interviewee's account. This tightly corresponded to the hermeneutics approach as this kind of the processes of data analysis "*falls within the hermeneutical journey of making sense of the participant's account*" (Smith et al., 2009).

The final stage of the analysis in this study was to compare the empirical findings to those of the reviewed literature in order to propose the final version of the e-skills policy-making framework. This was resulted in the framework shown in Figure 14, which reflects some differences between this framework and that one from Figure 12, constructed upon the pertinent literature review.



CHAPTER 4: EMPIRICAL FINDINGS

4.1 General findings

The general finding of this study is that there is an absence of and, therefore, need for a “*broad e-skills policy framework*”:

In light of all the above, there is an absence of a broad e-skills policy FRAMEWORK to fit the elements together (Interviewee 3).

The need for a policy-making framework in South Africa is evident as there is not known (at least to me...) any e-skills policy-making framework relevant to the developing countries such as South Africa - particularly not in a developmental context... (Interviewee 5)

Some of the respondents believe that the Government of South Africa realised the importance of the human resource capacity development, citing the National Development Plan (NDP) (e.g. Interviewee 1, Interviewee 5, Interviewee 6), hence recognised need for suitable strategies and policies, including “*well crafted e-skills policies*” based on a “*sound framework*” (Interviewee 5). The e-skills policies devised by using an appropriate framework must reflect a “*new e-skills value proposition*” in order to support NDP (Interview 8). However, this recognition is not sufficient as there are still “*leadership*”, “*public*” and “*cultural*” challenges that must be taken into account while looking at the general current e-skills policy landscape in South Africa (e.g. Interviewee 2, 5 and 6).

The above reflects as “*in silo*” or “*pocket of interventions*” (Interviewees 1 and 5) approach to skilling (including e-skilling) in South Africa as “*in business is that people find their way*”, “*in public, in most instances people help themselves*”, and “*culturally, we have been adopting technology that has been sold to us by clever sales people*”.

In addition,

“The biggest challenge facing South Africa is that of leadership or lack thereof. This is true for all stakeholders not only government. The ability for all stakeholders to place themselves on a timeline is a big challenge and as a result lack of perspective as to where they are going” (Interviewee 2).

Responding to the question regarding current e-skills policies in the country, respondents gave diverse answers mentioning different documents: some relevant to the formation of e-Skills Institute (e-SI) to some international e-skills frameworks (e.g. SFIA) and the national strategic action plans such as the National e-Skills Plan of Action (NeSPA). One of the respondents stated that he is not familiar with any *“true e-skills policy documents that force, reinforce or rectify e-skills issues”* in the country (Interviewee 5). The answer of the Interviewee 2, however, somewhat summarising the respondents view regarding the current e-skills landscape in South Africa: *“none of the international frameworks can be applied “As-Is” to South Africa”*. In the government context there are some documents in which *“reference is made to ICT and the need for ICT skills purely for government efficiency”* while in education *“some policies at local universities requires students to have basic computer literacy prior to admission”*.

Regarding needed e-skills intervention policies in South Africa, respondents also gave diverse opinion ranging from very general such as:

- *“everything is already given in the National e-Skills Plan of Action”* (Interviewee 1)
- the *“NeSPA, as a strategic plan of action should be supported by a set of policies, which should be regulated by the next version of NeSPA”* (Interviewee 5)

to particular ones such as:

- e-skills policies must support NDP and other national development programmes (e.g. MTSF): *“Strategic intent must be clear and support the national goal of the country. ICT can support the vision of a country”*(Interviewee 1)
- and international developmental (e.g. MDGs, WSIS) programmes (e.g. Interviewees 5, 6 and 8).

The above finding suggests the notion of overarching nature of the needed e-skills policies:

“E-skills policy must be holistic and be supported by national legislation for example the PFMA must support Skills Development and the Skills Development cannot operate in a vacuum” (Interviewee 2).

“Skills development does not happen in a vacuum...” (Interviewee 1)

This also means involvement of as many stakeholders as possible: government, businesses, education or non-profit organisations (Interviews 4, 5 and 7). This kind of cooperation is deemed by the interviewees as an optimal way for identifying needs for e-skills in the country - and also a prerequisite for good policy-making. Some of the respondents have particularly mentioned addressing skills for youth, women, older people and vulnerable groups such as people with disabilities or refugees (Interviewees 2, 5, 6, 7, 8, and 9).

However, it is stressed by some interviewees that holistic skills development also includes holistically addressing supply and demand: *“e-Skills policy must address both the demand and the supply i.e. covering the general population to the thought leader. . . Should not worry about over supply”* as illustrated by this answers by Interviewee 2.

Positioning e-skills policies in the national-wide context, one of the respondents believes that e-skills policies should be an integral part of *“e-skills ecosystem”*, thus reflect a *“systemic place for an e-skills policy framework”* (Interviewee 5). The importance of an e-skills ecosystem is also in supporting *“local innovation and this should include incubation...”* (Interviewee 2) – hence this must be considered as significant for e-skills policy-making. Furthermore, some of interviewees (e.g. Interviewees 3, 5, 6) firmly believe that the South African e-skills policies also must consider international and national socio-economic and technological changes that *“inevitably impact on e-skilling in South Africa”* (Interviewee 5).

Summarising the above findings it can be concluded that the above discussion discloses presence of the some policy-making elements, such as *“Collaborative e-skills ecology”* that are already present in this study’s e-skills policy-making conceptual model derived from the reviewed literature (Table 4 and Figure 12).

However, there are some new conceptual elements, such as “national and international context” or the “systemic nature” that should be taken into consideration for the e-skills policy-making framework. Hence, the next sections bring discussion regarding the relevance of: (i) the elements of the e-skills policy-making framework derived from the literature and also (ii) conceptual elements derived from the analysis of the conducted interviews.

4.2 Relevance of the conceptual framework derived from the literature

The analysis of the interviews conducted in this research showed that all respondents, whether explicitly or implicitly, agreed that the elements of the literature-based framework shown in Chapter 2 (Table 4 and Figure 12) are important and should figure in the final framework of this study.

4.2.1 E-skills related awareness

“Awareness is crucial for successful policy implementation interventions, especially if one is targeting society at large” (Interviewee 2).

The above response from one of the participants echoed beliefs of all interviewees. However, the participants stressed that the e-skills related awareness should not be partial but *“should be linked to vision and benefits not just the definition of what is an e-skill”* (Interviewee 2). *“Awareness is critical at all levels”*, believe Interviewee 1, 6, 7, 8 and 10. *“Understanding of what are the future skills needed, allow for decision-makers to implement change within their organisations and must be visible at all levels”*, elaborated Interviewee 1 and, in a way, summarised the stance of other respondents. E-skills awareness campaigns must stress importance of ICT as a *“...key enabler to support the NDP...”* as *“this will automatically elevate the importance of e-skills”*.

A number of the respondents (e.g. 5, 7, and 9) believe that the e-skills related awareness must encompass not just awareness of access to ICT and value (benefits) of e-skills but also awareness what e-skills are needed for a particular social or economic groups of people. For example, what skills are needed for starting and running small business (Interviewees 4, 7, 10) or what e-skills should one possess in order to be digitally included (Interviewees 5, 6, 7 and 8). It is also

important to be aware of the places that offer e-skills training (Interviewees 4 and 10).

The above discussion has confirmed relevance of the “Context-related awareness” component of the literature reviewed derived conceptual framework of this study. However, the comparative analysis of the literature-based framework and the conducted interviewees revealed some new, empirically-derived elements that somewhat complement the literature-derived ones (section 2.3.1.1 Context-related awareness). Hence, the final e-skills awareness component of the policy-making framework should consist of:

- awareness of ICT access and availability;
- awareness of the ways in which ICT can be used in everyday life and work;
- awareness of ICT impact and benefits;
- awareness of the context relevant e-skills; and
- awareness of the places offering e-skills training.

Answering the question of the way/s for spreading awareness, the interviewees had various suggestions: from using SABC (National TV) and radio (interviewees 3,4, 6, 9 and 10) to running the awareness campaigns (Interviewees 5, 8 and 9) and more systematic development of awareness through the education system (Interviewee 5).

4.2.2 Collaborative e-skills ecology

All interviewees have agreed that the collaborative approach to e-skilling has no alternative as *“it is absolutely crucial in the areas of understanding demand and supply, courseware or content, and research and development”* (Interviewee 1).

The national government (together with Provincial and Local) are seen by some the interviewees (e.g. Interviewees 3, 4 and 5) as the key factor in initiation and development of the collaborative e-skills ecology:

“Governments need to establish a formal multi-stakeholder collaboration process to coordinate effort aimed at delivery of socio-economic and cultural appropriation of ICT” (Interviewee 3).

However, participation of other possible stakeholders such as business and education is crucial as *“closer relationship with industry and universities to support and conduct targeted research - not just pure research but also to create policy shifts e.g. incubation; home-grown solutions to create the shift towards developers of solutions instead of importers of foreign solutions...”* (Interviewee 1). Involvement of the civil society organisations (e.g. non-profit organisations) is also considered as highly important: *“...non-profit sector is the second largest employer in this country and have a number of providers of ICT training...”* (Interviewee 6) and *“...excluding them [NPOs] we will never be able to upscale e-skills intervention...”* (Interviewee 9).

Pointing to the differences between developing and developed worlds, one of the interviewees stressed that, despite differences, the notion of collaboration is equally important to both:

“In my opinion “Collaboration” in South African is very different to that of the developed world. Yet we understand the importance of bring all the key role-players together to bring about a new life-style with technology at its core” (Interviewee 2).

A number of interviewees have also pointed to some challenges related to better collaboration in South Africa. In particular, these challenges are related to inclusion of young people, vulnerable groups (e.g. people with disabilities), socially excluded groups (e.g. immigrants, refugees), people from informal sector of economy or even “ethnic domination”:

“What is challenging however is that the younger generation understands the importance of working in groups etc... and thus from a learning perspective makes it very difficult to mark them individually” (Interviewee 2).

“... does anybody think about including people with disabilities in the mainstream of the technology dominated society? What is visible, only some NPOs here and there...” (Interviewee 6).

“It is OK to include big stakeholders groups such as business or education...but in order to prepare society for 21st century, we have to include

everybody – for example, large population of people operates in informal economy... (Interviewee 7).

“Also important to note is that ‘white’ folk is currently dominating this space, big question is how to broaden diversity” (Interviewee 2).

The analysis of interviews should the relevance of the literature review findings that suggests engaging stakeholders through the “*collaborative network architecture*” to develop collaborative and integrated national policies aimed at achieving desired impact (section 2.3.1.2 Collaborative e-skills ecology). The interviewees suggest that that “collaborative ecology” should include:

- Major stakeholders groups such as governments, businesses, education or civil society organisations; and
- Minor stakeholders groups such as people with disabilities or the groups at risk of social exclusion (e.g. immigrants).

The above corresponds with the reviewed literature, which strongly suggests that the personal opinions, corporative interest, lobbying, ideological values and other “non-measurable” factors can only be capture during the interaction of stakeholders and policy-makers interact within social networks. These factors, which are not research obtained, often prevail on the scientific evidence.

4.2.3 Excellence education for all

The interviewees in this study agreed that, despite major changes that occurred in society and economy (including widespread access to ICT and new patterns of information use thus requiring new skills) the ICT training programmes at educational institutions are lagging behind the fast-moving pace of technology development. This is particularly true for many primary and secondary schools in the country. Therefore, e-skills policies should support and take into account excellence education for all. Here are some typical opinions:

“We are witnessing many unfavourable developing in the education sector in this country...and it will negatively impact preparing generations for jobs of this times...” (Interviewee 6).

“Securing excellent education for all is our obligation as we have adopted the UN Millennium development goals...” (Interviewee 7).

“Excellent education for all is very important and quality is dependent on the outcome of monitoring and evaluation” (Interviewee 1).

“There is not possible to develop Information Society without sound educational system that produces graduates able to effectively use nowadays technologies...” (Interviewee 5).

A number of the respondents stressed importance of ICT in modern education for all:

“Technology allows to “develop and push online content thus calls for new approaches to deliver education” (Interviewee 1).

“Going forward we have to located education with a new context i.e. think of an “e-world”; best society where it is more valuable to have one computer than no computer in schools, community centres, etc.”(Interviewee 2).

“Embed technology into people’s lives if we are to derive value of ICT... and do it through education...” (Interviewee 3).

The empirical findings regarding importance of having excellent education for all corresponds to these of the literature review findings, which suggests that skills development through *“education for all”* have economic payoffs as, for example, forecasts predict that by 2015, 90% of jobs will need at least basic computer skills if workers want to remain employable.

However, some respondents cautioned that achieving an excellent education for all is easy and straightforward task in South Africa:

“It can be achieved in South Africa but only over a long period of time.

The reality of our diversity must be taken into account... We are still dealing with issues of our past i.e. Apartheid” (Interviewee 2).

Summarising this section it can be concluded that having an excellent education for all - as the component of the e-skills policy-making framework - is highly important and that:

- It must be systemically addressed through the educational systems and
- ICT based in order to achieve a larger scale, .i.e. reaching a broader population.

4.2.4 Futures of ICT capabilities and knowledge infrastructure

The interviewees agreed (explicitly or implicitly) with the literature review finding that, while changes have occurred in the economy, work and in society, educational systems worldwide experienced limited changes related to keeping pace with changes in those sectors – indicating that knowledge must be integrated, i.e. networked (section 2.3.1.4 Futures of ICT capabilities and knowledge infrastructure).

“[It is] important for us to imagine a future where knowledge and information can play a different role. For example: Schools in terms of learner assignments... Students “2-3 years” expectations of teachers... Parents have to play a role in how to get information and judge information” (Interviewee 1).

Building a knowledge infrastructure is particularly important for policy-making as *“it is proven by theory and practices that theory can assist policy-makers... and theories can come only from having well developed knowledge structures... as it is case in many developed countries...”* (Interviewee 5). This can be achieved by *inter alia* building a relevant *“taxonomy proactively aligning research to national priorities ...”* (Interviewee 3).

The understanding of the future development use of information and communication technologies for creating knowledge infrastructure in a country is highly important as *“...tertiary education need to be co-opted into to establishing independent spaces for this collaborative effort of government, education, non-profits and alike in order to create space that can deliver a knowledge necessary in dealing with inequity and other important issues...”* (Interviewee 3). A good example of a building a knowledge infrastructure (and space that offers an excellent education for all, as discussed

previously) is the newest trend of offerings of the Massive Online Open Courses (MOOCs) by the best world universities (Interviewee 2).

The Interviewee 6 believes that the knowledge structures base on based on the capabilities of the present and future ICT is one of the keys to “*save this planet...*” and must be “*...an integral part of e-skills policy-making...particularly in the developing world, where many things are not yet regulated...*”. This corresponds to the literature review finding that asserts that the knowledge, linked in an appropriate infrastructure, is particularly important in developing countries as it is base to achieve sustainable-development goals (IDRC, 2008).

The interviewees’ view on the topic described in this section corresponds to the latest thinking in the EU, which suggests that personal opinions, corporative interest, lobbying, ideological values and other “non-measurable” factors can only be captures during the interaction of stakeholders and policy-makers within social networks. These factors, which can be captured through knowledge networks, and are not research obtained, often prevail on the scientific evidence (DAE, 2013)

Summarising this section it can be concluded that the interviewees believe that it is particularly important to identify future appropriate ICT that can affect social and economic progress, which corresponds to the findings in the revived literature (e.g. Adam et al., 2007; Isaacs, 2007). The knowledge obtained through the collaborative networks (knowledge infrastructure) is *inter alia* important for continues reassessment of the skills that people already have over what they need (Davies et al., 2011). Hence, this element named as “Futures of ICT capabilities and knowledge infrastructure” should be an integral part of the e-skills policy-making framework.

4.2.5 Research and development

“*Building an e-skills research base is critical for the country...*” (Interviewee 2) since it is “*... a prerequisite for creating an informed strategy and policies...*” (Interviewee 5) particularly, when there is no possibility to replicate experience of other similar countries (Interviewees 6, 9 and 10). Building strong research base will “*...inevitably support evidence-based policy-making... and “continuous research in a cross disciplinary manner should concentrate on new ways to embed technology into*

people's lives in order to improve, for example, business opportunities, access to government services... (Interviewee 3)

However, the interviewees deem that not any research will suffice - it should be the collaborative research if an appropriate evidence for the policy-making is to be obtained:

"Closer relationship with industry and universities to support and conduct targeted research..." (Interviewee 1)

"Collaborative research that includes national and international universities and institutes is a key for sharing evidence and best practice that we can use for sound policy-making..." (Interviewee 5)

"...including donors or funders in [the] research cooperation can be one of main things you can do to support good policy-making..." (Interviewee 7).

Some participants believe that the policy-creation related research can and should be also used for helping in broader field of socio-economic development:

"Not just pure research but also to create policy shifts e.g. incubation; home-grown solutions to create the shift towards developers of solutions instead of importers of foreign solutions..." (Interviewee 1)

"...there is not much money for research in the non-profit sector...e-skills research can be easily used for better understanding of how is technology used by these organisations..." (Interviewee 6)

It also stressed by some interviewees that broader international collaboration is needed in order to extract the "best practice:

"More comparative studies should be encouraged and include other African countries such as Kenya" (interviewee 2)

"...this has [research] to tap into MDGs and WSIS research and assure that development of skills fit the purpose of development of Information Society..." (Interviewee 8)

“Development is not possible without research...it will be only guess what and how to develop without facts...” (Interviewee 10)

However, majority participants stressed that the policy supporting research is not possible to develop without an adequate funding:

“... [develop] funding mechanisms to allow for technology foresight research”
Interviewee 2)

“We need e-readiness funding mechanism...research included...”
(Interviewee 3)

“... but, again...research and development require resources, funds...”
(Interviewee 9)

Yet, some of the interviewees expressed a concern that the evidence-based research might not be utilised:

“... according to some reports not even 20% developmental policies are based on fact discovered through research...what would be different with e-skills policies?” (Interviewee 5)

“...it is just theory...people prefer to get opinion from “savvy” friends and co-workers than to waste time reading boring reports...” (Interviewee 9)

Summarising this section, it can be concluded that e-skills related research and development is important component of the e-skills policy-making research framework. This concurs with the literature review findings regarding importance of achieving the right policy impact (e.g. Foley et al., 2002) and boiled more effective bridges between knowledge, policy and practice (Hearn & White, 2009), involving the various stakeholders (Singh, 2012). However, the interviewees also cautioned that the knowledge gained by research can be isolated from the policy-makers and practitioners in the field –as asserted by Bird et al. (2004)

4.2.6 Cost and affordability

All interviewees agreed that the cost of ICT connectivity in South Africa is still high. Coupled with still high price of modern information and communication technologies equipment (e.g. smart phones, tablets) this severely impact on affordability of these technologies. And, consequently, this will impact use of ICT for learning, work and other needs:

“...the high cost of access can be a barrier to learning...the high costs of insufficiently developed ICT infrastructure can result in poor rates of ICT usage” (Interviewee 3)

“...costs of connectivity, devices and also learning and skilling will very much impact on policy-making... it has to be taken into account when devising e-skills strategies and policies...if you look at NeSPA 2010, it suggested development of a proposal to examine a national transfer pricing model to provide a level of free cell phone and Internet access...”(interviewee 5)

“Any costs, including computers, mobile phones...affect use of these by non-profit organisations...but not only cost of equipment ... also affordability of learning new skills...” (Interviewee 6)

Interviewees 4 and 10 also agree that the costs of “*all kinds*” (Interviewee 4), particularly for “*small and informal businesses*” (interviewee 10) can also impact on use of ICT and should be considered when making e-skills policies.

There were, however, dissonant opinions such as this one:

“[cost is] no longer seen as a major hindrance. People will find ways once they have established the benefit/s of the technology” (Interviewee 2)

Summarising discussion in this section, it can be concluded that majority of the interviewees believe that costs and affordability must be addressed by e-skills policies. Universal access should be provided to *all persons in all areas and communities* in order to skill people, obtain quality, affordable and usable access to a publicly available minimum set of quality electronic communications network service and electronic communications service (Gomez, 2012).

4.2.7 E-inclusion

The analysis of responses regarding the term “E-inclusion” showed that this concept is differently understood by various interviewees:

“Firstly there is a need to unpack what is meant by “E-inclusion”. Once the understanding is reached they i.e. businesses, individuals and government will find it easier to identify the required actions steps over a period of time.”
(Interviewee 2)

“ [E-inclusion as] e-skills foundation skills is important to improve quality of life...see, for example, the advert of First National Bank (FNB) lady selling banana’s, every month she takes the bus to pay her suppliers, had she had access to technology and the skill to use it she could avoid travelling to the bank and access online banking.” (Interviewee 1)

“...do you mean digital inclusion? ...if it is giving access to technology to all, particularly to previously disadvantaged people, and also to teach them how to use technology, that E-inclusion is certainly important for e-skills policy making...” (Interviewee 6)

“...E-inclusion is highly important for e-skilling people...it is widely understood that without modern ICT and people able to use these technologies, there is no successful e-government... I mean, there is no successful ‘electronic service delivery...” (Interviewee 5)

Although there is no common precise understanding of the term E-inclusion, it is evident that the interviewees consider this concept as important for e-skills policy-making as *“... the role of advocacy in building an e-inclusive society cannot be overstated”* (Interviewee 2) and is particularly important *“to promote an active citizenry, especially targeting citizens residing in deep rural and rural areas”* (Interviewee 1).

In summary, it can be concluded that the responses from the interviewees echoed the literature review findings that showed that it is important to understand how to proceed from a socially excluded e-society to an e-inclusive one (e.g. Sen, 2000; Zheng & Walsham, 2008; Foley et al., 2002). Hence, E-inclusion should form the

foundation upon which to build an e-skills policy framework with a key focus on education (e.g. Wilensky, 1975:3; Busemeyer, 2012).

4.2.8 Monitoring and evaluation

Monitoring and evaluation must be a fundamental part e-skills policy-making framework. This is opinion of all interviewees and here are some examples:

“Developing policy-making, research, monitoring and evaluation must be seen as synergetic activities...they must be in a function of each other’s...and must be an integral part of any e-skills intervention...yes it is a time-consuming but must be used to guide policy-makers” (Interviewee 5)

“...monitoring and evaluation should be done against the planned actions specified and should include output, outcome and impact...yes, it is not easy to evaluate impact but is very important...” (Interviewee 7)

“Given the rapid changes in ICT and related skills required a mechanism is required to monitor and evaluate impact...” (Interviewee 1)

“Monitoring and evaluation is a part of good governance and, no doubt, it must be done...without that we would not be able to determine if an intervention is worth while or not...” (Interviewee 6)

Monitoring and evaluation coupled with e-skills research is seen as critical by some of the interviewees, particularly when skilling of people at the local level:

“... we need more local evidence... local evidence will become more and more critical in decision-making and planning for a bright future...we also need mechanisms and process to support analysis of big data...supply vs. demand studies are needed to track progress and gaps will influence policy-making”(Interviewee 2)

The above answers support the literature findings that monitoring and evaluation should be used for gathering substantive evidence in order to adapt and improve policy processes and policies (S.A Presidency, 2012). This can influence the current approach in which much space in the policy development is left to the policy-makers

own values, experience, expertise, judgement, the influence of lobbyists and pressure groups, pragmatism, or based on the resources available, than on evidence (Young & Mendizabal, 2009). Keeping a good record of common data, and have a good understanding and knowledge of the issues relating to e-skill will help to bridge the gap between demand and supply of e-skills - as found in Singh(2012) and also stated by Interviewee 2. The South African e-skills agenda, being still relatively new, needs an appropriate foundation for decision-making and that foundation are seen as evidence-based policy-making (Mitrovic, 2010) that partially comes from monitoring an evaluation of e-skills interventions.

4.3 New conceptual elements

Conceptually viewed, the above discussion discloses relevance of the policy-making elements that are already present in this study's e-skills policy-making conceptual model derived from the reviewed literature (Table 4 and Figure 12). However, in a view of some interviewees, there are some new conceptual elements that should be taken into consideration for the e-skills policy-making framework. The discussion below supports inclusion of two additional elements in the final e-skills policy-making framework: (i) Integrated and systemic approach and (ii) Value proposition.

4.3.1 Integrated and systemic approach

“Most e-skills policies relates to the ICT practitioner...What I have observed is the absence of an integrated e-skills framework that supports the Information Society or Knowledge Society” (Interviewee 2)

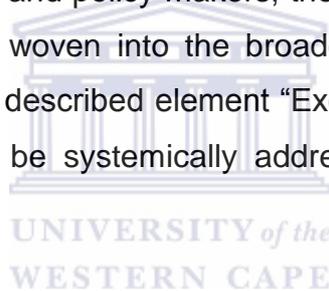
This citation from one of the interviewees refers to systemic or integrated environment, which should be considered when making e-skills policies. This was then supported by Interviewee 5 who believes that e-skills policies would not achieve greater impact if they are not *“in function of building and maintain an e-skills ecosystem...”* Furthermore, Interviewee 5 deemed that *“systemic dimension of policy-making must reflect NeSPA 2010 recommendation to systemic e-skilling the nation for equitable prosperity and global competitiveness...”*

“...successful practices in a number of developed (e.g. UK, Australia or New Zealand) and developing countries (e.g. Mexico, Cuba, Kenya or Rwanda) showed that formalised integration and aggregation across various stakeholders are essential requirements for e-skilling success...this integration in South Africa is

needed within and across government, the private sector, education and civil society.” (Interviewee 3)

Furthermore, Interviewee 5 suggested that *“e-skills policies should support national, provincial or local developmental plans, programmes or agendas...as it is the case with the National Plan of Action...I mean, it should not support patched actions but should be systemic in its nature...”*

These opinions prompted this author to further explore the integration element of policy-making framework. Further analysis of previously established elements of e-skills frame framework showed that this element, here named as “Integrative and systemic approach” is closely linked to the “Collaborative e-skills ecology” but is not the same. While the Collaborative e-skills ecology suggests the cooperative interaction of the stakeholders and policy-makers, the conceptual element described here points to an integrated, woven into the broader policy-making context. This makes a link to the previously described element “Excellent education for all”, which suggests that e-skilling must be systemically addressed through the educational systems.



The above corresponds to the literature review finding that points to the fact that e-skills Institute (e-SI), through the SA government and the Department of Communications (DOC), was originated to create and execute a national e-skills agenda in a *“systemic and systematic manner”*(Mitrovic et al., 2012). The integrated approach can help to achieve sustainable-development goals (IDRC, 2008) and help integrating knowledge needed to address rapid changes occurring in the economy, work and in society Kozma (2009).

4.3.2 Aggregation

The Interviewee 2 has explicitly mentioned a concept of aggregation as a part of monitoring and evaluation, which sparked analysis of other interviews regarding that concepts and its possible inclusion in the e-skills policy-making framework. It was indeed found that some other interviewees also believe that aggregation is highly important for e-skills policy-making:

“...NPOs usually have very limited resources, so we tend to put together what we have in order to address certain issues...and to base our policies on the available resources...” (Interviewee 6)

“...the e-skills aggregation should better position South Africa for the networked society...aggregations should help aligning diverse capabilities around addressing issues of employment, innovation, productivity, inequity and skills development...” (Interviewee 3)

“...a kind of integration or aggregation of resources, efforts and...which is more important, results... it can positively impact people’s capability to develop skills for a socio-economic development... it must be an integral part of this e-skills ecosystem (Interviewee 5)

The literature review, following the appearance of this concept as a possible element of the e-skills framework, showed that there is not much published regarding aggregation in skilling or competences development. There were, however, found some instances that support validity of the concept of aggregation. For example, it is believed that heterogeneity and aggregation problems have been a concern in economic theory for long (León-Ledesma et al., 2011) but aggregation is found as important for competences development, particularly aggregation “*for a specific job...*” (Vojvodic, 2012). Another instance shows that the concept of aggregation is highly relevant in the South African context as, when launching the National Development Plan (NDP2030), 15 August 2012⁶, T. Manuel, Minister in the Presidency stated that:

“National Planning Commission painted a picture based on the aggregation of effort across South African society by using the words ‘active citizenry’, ‘people centred development’, ‘improving coordination within government’, ‘collective responsibility’ and ‘implementation’. With these words he highlighted the need for coordination, aggregation and integration as being central to the National Development Plan”.

⁶ See: <http://www.info.gov.za/speech/DynamicAction?pageid=461&sid=29845&tid=79973>

In summary, it can be stated that, although not yet much reported in the literature, the concept of aggregation should be taken into account when creating e-skills policies, i.e. should be an integral part of the e-skills policy-making framework. Aggregation, in the context of this study, means aggregation of resources, efforts and results in order to inform an effective policy-making.

4.4 Proposed e-Skills Policy-making Framework in South Africa

Having in mind the findings from the reviewed literature and the subsequent analysis's and the interview-related (empirical) findings, this study proposes the e-skills policy-making framework with the following elements:

- Context-related awareness
- Collaborative e-skills ecology
- Excellence education for all
- Futures of ICT capabilities and knowledge infrastructure
- Research and development
- Cost and affordability
- E-inclusion
- Monitoring and evaluation
- Integration and systemic approach
- Aggregation



An auxiliary analysis of the identified elements of the e-skills policy-making element suggested that these ten (10) elements can be further grouped in three (3) overarching components here named as Thematic, Contextual and Systemic – as shown in Table 5.

Table 5: Elements of the proposed e-Skills policy-making framework (Source: Author)

| e-Skills Policy-Making Framework | |
|---|----------------------------------|
| Thematic | <i>E-inclusion</i> |
| | <i>Cost and affordability</i> |
| | <i>Research and development</i> |
| | <i>Monitoring and evaluation</i> |

| | |
|-------------------|---|
| Contextual | <i>Context-related awareness</i> |
| | <i>Collaborative e-skills ecology</i> |
| Systemic | <i>Integration and systemic approach</i> |
| | <i>Aggregation</i> |
| | <i>Excellence education for all</i> |
| | <i>Futures of ICT capabilities and knowledge infrastructure</i> |

The **Thematic** group of the policy-making framework elements suggests that the e-skills policies can include any relevant theme or topic but should be primarily concerned about:

- *E-Inclusion*: as a prerequisite for building already emerging Knowledge Society;
- *Cost and affordability*: as these factors can hinder use of ICT and development of e-skills;
- *Research and development* as it is a crucial for further e-skills development (e.g. determining demand and provision); and
- *Monitoring and evaluation*: as it is indispensable to determine if an e-skills intervention generates the planned output, outcome and impact.

The **Contextual** group of the policy-making framework elements suggest:

- *Context-related awareness* is needed to establish and influence of, for example: (i) awareness of the ways in which ICT can be used in everyday life and work; (ii) awareness of ICT access and availability; (iii) awareness of ICT impact and benefits; or (iv) awareness of the needed e-skills and how to acquire them;
- *Collaborative e-skills ecology* as it suggest participation in e-skills policy-making of “contextual“ or national, provincial or local stakeholders: (i) mayor stakeholders groups such as governments, businesses, education or civil society organisations; and (ii) minor stakeholders groups such as people with disabilities or the groups at risk of social exclusion (e.g. immigrants, homeless people).

The **Systemic** group of the policy-making framework elements suggest that:

- *Integration and systemic approach*, which includes integrated and collaborative work within and across government, the private sector, education and civil society, is essential in South Africa to develop a Knowledge Society and achieve more equal development and global competitiveness. This element also suggests that e-skills policy-making should support national, provincial and/or local socio-economic developmental plans, programmes or agendas.
- *Aggregation* is needed to concentrate resources, efforts and results in order to achieve socio-economic impact, which essentially e-skills policies should support. This element of e-skills policy-making framework supports the idea that “in silo” or “patched” approach will not succeed.
- *Excellence education for all* is indispensable for appropriate e-skills development and the use of ICT for socio-economic appropriation. This kind of education must be systemically addressed through the educational systems.
- *Futures of ICT capabilities and knowledge infrastructure* bears significance in the facts that, for e-skilling, it is highly important to identify future appropriate ICT that can affect social and economic progress. The knowledge obtained through the collaborative networks (knowledge infrastructure) is *inter alia* important for continued reassessment of the skills that people already have over what they need.

The graphical representation of the proposed e-skills policy-making framework is given in the next figure (Figure 14).

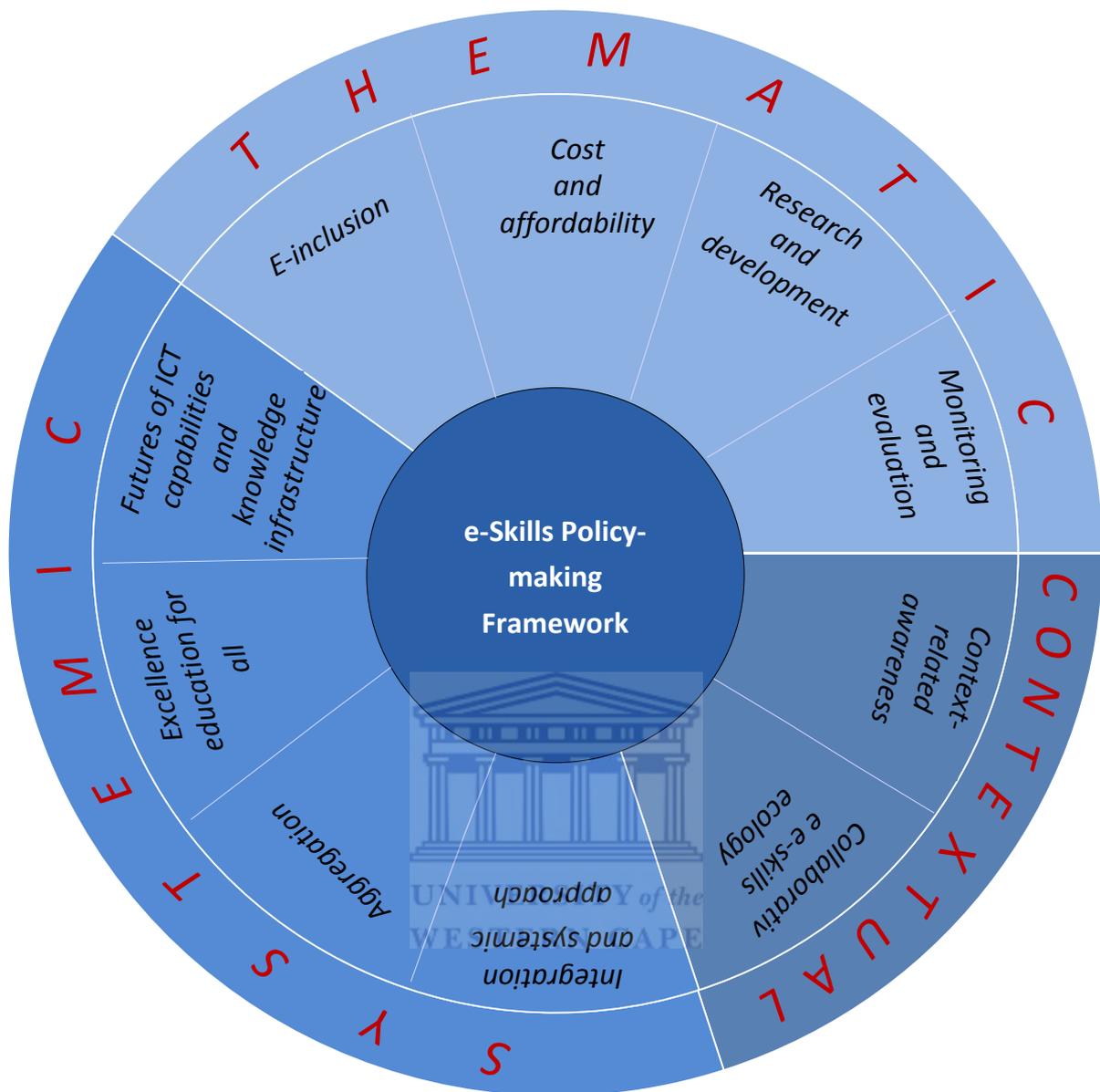


Figure 14: Proposed e-skills policy-making framework in South Africa (Source: Author)

The next chapter concludes this study by explaining how the research objectives were reached, how this study contributes to the theoretical body of knowledge, what are practical implications and what are the limitations of this study.

4.5 Proposed fitting into the policymaking process

Testing this author’s presumption reading the position of the elements of the Conceptual framework for e-skills policy-making⁷, six interviewees⁸ agreed that the

⁷ Sections 2.1.4 Policy-making processes: the contemporary thinking and 2.3.2 Fitting into the policymaking process

positioning “*make sense*” (Interviewee 5) and “*can serve purpose*” (Interviewee 6) but also agreed that further research should be done in order to confirm (or otherwise) this positioning. They also have confirmed that the empirically identified elements of the e-skills policy framework: “Integration and systemic approach” and “Aggregation”)⁹. Figure 15 shows the positioning of these two elements:

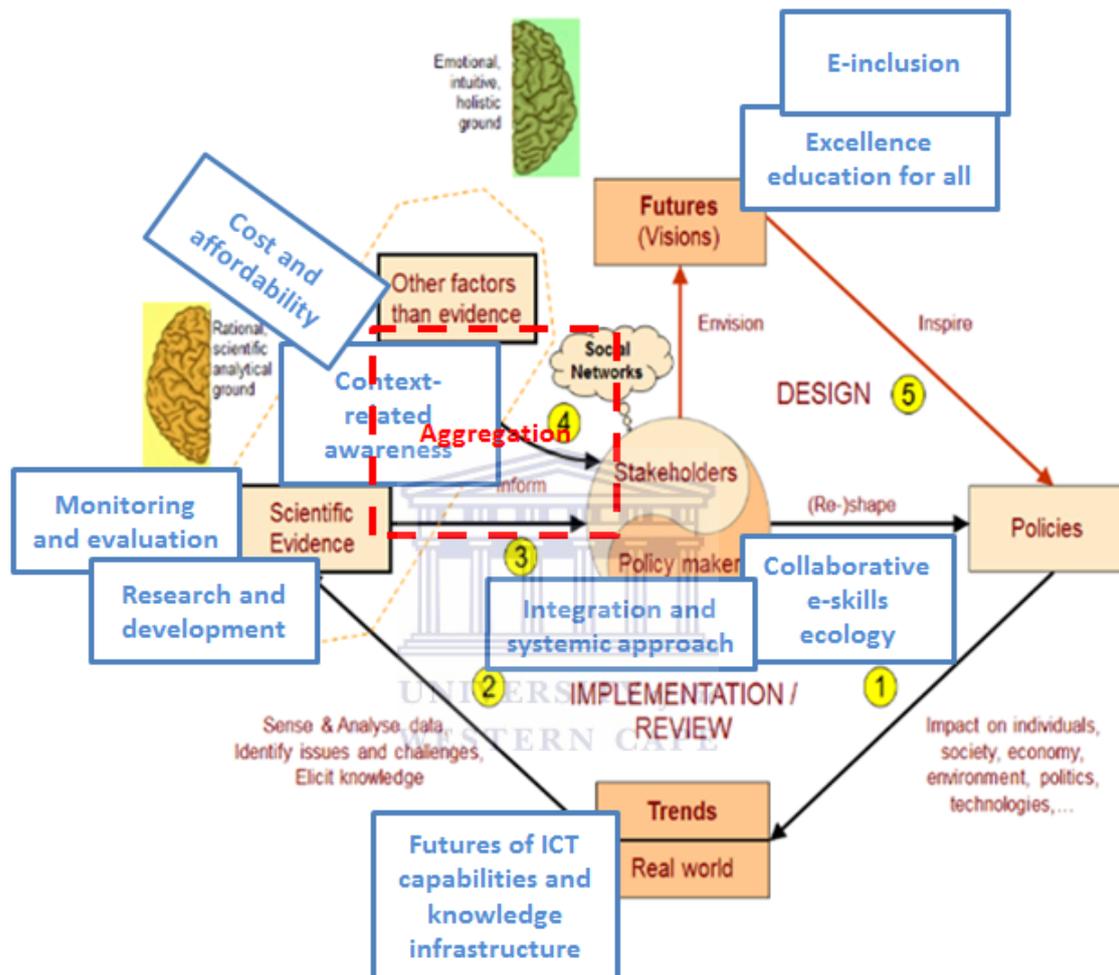


Figure 15: Proposed e-skills policy-making framework: fitting into the policy-making processes

As explained earlier¹⁰, the elements “Monitoring and evaluation” and “Research and development” of this study’s Conceptual framework for e-skills policy-making can be mapped to the “Scientific Evidence” of the Policy making 3.0 framework, as they are self-evidently related. The element of “Contextual-related awareness” is positioned between “Scientific Evidence” and “Other factors than evidence” as the contextually-

⁸ Other four interviewees could not be reached for the purpose of verifying this fit.

⁹ Section 4.4 Proposed e-Skills Policy-making Framework in South Africa

¹⁰ Section 2.3.2 Fitting into the policymaking process

related awareness can be scientifically measured but also depends on many other factors (e.g. awareness campaigns or political influence). Similar case is with the “Costs and affordability” element.

“E-inclusion” and “Excellence education for all”, in the South African context, clearly belong to the “Futures (Vision)” element as they are still to be achieved. The “Collaborative e-skills ecology” indicates collaboration between the policy-makers and other e-skills stakeholders (e.g. government, education, business, civil society organisations, as outlined by NeSPA, 2010) and here is, hence, associated with the networked “Stakeholders Policy makers”. The “Futures of ICT capabilities and knowledge infrastructure” is here associated with the Policy making 3.0 element “Trends/Real world” as understanding and exploiting future capabilities of ICT is of the vital importance for creating and use of the knowledge infrastructure that will impact (actually, is already impacting) the real world.

The empirically identified e-skills policy-making framework element “Integration and systemic approach” seems to be related to the stakeholders and policy-makers cooperation (multi-stakeholders cooperation) but can also be related to the aggregation as only integrated and systemic approach can support aggregation of resources, efforts and results. But aggregation also depends on other elements of the Policy making 3.0 Model such as political influence or personal agendas and also the scientific evidence related to these and similar factors. Thus, the empirically identified element of the e-skills policy-making framework “Aggregation” should span over few policy-making processes: “Stakeholders/Policy-makers” (networked) cooperation, “Other factors than evidence” and “Scientific evidence” - as shown in Figure 14.

CHAPTER 5: CONCLUSION AND RECOMMENDATIONS

This chapter is structured in the way that first presents the conclusion, followed by the recommendations of two kinds: for practical use and for further research. Then the contribution of this study is stated, following by announcing some limitations of this research.

5.1 Conclusion

This study aimed to identify key elements relevant to the e-skills policy-making in South Africa and to compile these elements in a framework that would help in guiding policy-making in this area. In that regard, the following research objectives were established:

1. To understand the theoretical and contextual background of policy-making;
2. To explore existing policy-making frameworks that might be relevant to e-skills policy-making;
3. To identify and classify e-skills related elements obtained from pertinent literature;
4. To verify these policy-making elements by interviewing experienced policy-makers in the fields of ICT and e-skills;
5. To suggest a framework for e-skills policy-making in the South African developmental context; and
6. To propose the guidelines for implementation of this framework.

The first objective was achieved by reviewing available literature regarding the process in policy-making, role of theory and research in policy-making and usefulness of evidence-based research in policy-making. This was followed by the exploration of the background of e-skills agenda in South Africa, various definitions of e-skills, rationale, benefits and impact of e-skills on the society, e-skills shortages and challenges.

Then the literature was reviewed in regard of existing frameworks that could be used as a possible guide for e-skills policy-making in South Africa and it was found that there are no available “tailor made” e-skills policy-making models that can be used in

the South African context. However, the literature review has elicited a policy-making processing model (Policy making 3.0) that was used to position the e-skills policy-making framework within the policy-making processes (sections 2.1.4 Policy-making processes: the contemporary thinking and 2.3.2 Fitting into the policy-making process). Consequently, the literature review proceeded with identifying and classifying elements that could possibly become a part of the e-skills policy-making framework. The achievement of this objective (No 3) resulted in a set of eight (8) elements of the Conceptual framework for e-skills policy-making in South Africa (Table 4 and Figure 12): Context-related awareness; Collaborative e-skills ecology; Excellence education for all; Futures of ICT capabilities and knowledge infrastructure; Research and development; Cost and affordability; E-inclusion; and Monitoring and evaluation.

The fourth research objective, to verify theoretical policy-making elements was achieved by interviewing a number of policy-makers in the fields of ICT and e-skills. In that regard, 10 policy-makers from government, academia, the corporate world and also from the “closer to ground” policy researchers from the parliamentary political parties and NPO. The interviewees have confirmed validity of the literature review identified policy-making elements but also suggested that two new elements should be also part of the final e-skills policy-making framework. These elements are Integration and systemic approach and Aggregation. Thus, these elements were included in the finally proposed e-skills policy-making framework in South Africa, which is given in Table 5 and Figure 14. The e-skills policy-making framework elements are then positioned within the Policy-making processes framework, which also explains how these elements can be used within the policy-making processes. By completing these tasks, the fifth and sixth objectives of this study have been reached.

5.2 Recommendations

This study brings two kinds of recommendations: for practical use of the framework and the recommendations for the further research.

5.2.1 Practical recommendations

The e-skills policy-making framework in the South African context has now been proposed and hopefully used and tested by a larger number of e-skills policy-makers

in South Africa. This author believes that the proposed framework will help the e-skills policy-makers to successfully concentrate resources and efforts for an effective policy-making which, if proves successful, can possibly be replicated in other similar developing countries. It is also recommended that the e-skills policy-making framework proposed by this study be used in conjunction with an appropriate policy-making processes frameworks or models such as the Policy-making 3.0 EU model. Also, it is recommended that the elements of this e-skills policy-making framework be used flexibly depending on the current context and changes that might occur in the socio-economic or technology fields. Particularly is important to take into account the fast pace of changes occurring in the realm of the information and communication technologies and consider possible development scenarios and foresight.

5.2.2 Further research

Having in mind that this research brings a novel framework for e-skills policy-making, the research into effective applicability of this framework should be of the primary concern. This is also applicable to the author's presumption reading the position of the elements of the proposed framework within here portrayed Policy-making 3.0 model and other policy-making processes models or frameworks.

It would be also important to capture and explore the experience of the users of this e-skills policy-making framework. This will help in possible revision and refinement of this framework. Furthermore, it would be possibly beneficial to explore use of this framework in other similar countries. The comparative studies in this regard could prove portability or transferability of the framework and its effective use in similar context, primarily in the developing countries.

5.3 Contribution of this study

It was envisaged that this research would contribute to better academic understanding of the area of e-skills policy-making and implementation at a national level but also to provide the guidelines (framework) that would assist both policy-makers and practitioners (policy implementers).

The main contribution of this study is seen in the fact that it brings a novel e-skills policy-making framework particularly design for the South African context but

keeping in mind that it can possibly be used in other similar developing countries. Theoretically, this study has added to the academic understanding of significance of certain concepts for e-skills policy-making derived from the pertinent literature but also of these identified empirically by this research. Now this study can be used for a practical implementation and also as a base for further academic research.

5.4 Limitations of this study

It is now appropriate to acknowledge some limitations of this study. The fact that the interview sample consisted of 10 interviewees does not limit validity of this study. However, some restraint shows in the detail that six of the interviewees have fully participated in answering questions while four of them omitted to answer questions regarding current South African policy-making landscape. This unfamiliarity with the e-skills agenda, however, did not prevent them to give a valuable input into validity of the elements of the proposed policy-making framework.

Another confine of this study might be seen in the fact that the policy-making processes of the model Policy making 3.0 are not explained in greater details. This is caused by insufficient explanation in the models document. However, it is deemed that the policy-making processes are (arguably) well known to policy-makers so this limitation will not be of a particular significance.

Nevertheless, these limitations are not seen as impediments that might endanger the validity of this study and its results. Hence, this study is presented here with all its strengths and limitations.

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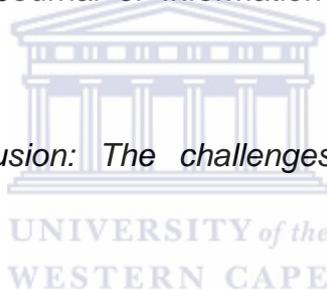
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APPENDICES



APPENDIX A: CONSENT TO PARTICIPATE IN RESEARCH

Title: *A framework for e-skills policy-making in South Africa*

You are asked to participate in a research study conducted by Ms Mymoena Sharif from the e-Skills Institute, Department of Communications (DoC), Pretoria.

This research study is partially conducted towards the completion of the researcher's MCom (Information Systems) thesis at the University of Western Cape.

You were selected as a possible participant in this study because you are considered as an expert either in the field of e-skills or policy-making.

1. PURPOSE OF THE STUDY

The aim of the study is to determine the elements and their linkages in the policy-making framework that can be used for e-skills policy-making in South Africa.

2. PROCEDURES

If you volunteer to participate in this study, we would ask you to do the following to:

- a) Meet with the researcher at your convenience and answer the interview questions.
- b) To offer relevant input that was not covered by the interview questions.

The meetings will take place at the place of your convenience during a time suitable to you.

3. POTENTIAL RISKS AND DISCOMFORTS

No potential risks or discomfort are envisaged as the interview questions are not of a personal nature.

4. POTENTIAL BENEFITS TO SUBJECTS AND/OR TO SOCIETY

The potential benefits for the interviewees might be the newest insight into pertinent literature, which will be presented through the interview questions and the researcher's input. However, the benefits for a society can be considerable. The e-skills policy-making through the framework offered by this study can positively affect the entire South African nation as it will be used in the researcher's everyday work regarding "*skilling the nation for equitable prosperity and global competitiveness*" (National e-Skills Plan of Action – NeSPA).

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 or as required by law.

The researcher further pledge that any information given by participants will be handled in the strictest confidence, and that the information students give will not be used to reflect negatively on them in any way. The information will be stored in files that will be locked in the filing cabinet of the researcher.

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. The researcher may withdraw you from this research if circumstances arise which warrant doing so such as you not attending the monthly meetings over the course of the research period.

8. IDENTIFICATION OF RESEARCHER

If you have any questions or concerns about the research, please feel free to contact my supervisor Dr Zoran Mitrovic at (021) 959-2162 or e-mail zmitrovic@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.

SIGNATURE OF RESEARCH SUBJECT OR LEGAL REPRESENTATIVE

The information above was described to me, the participant, by Ms Mymoena Sharif in English and I am the participant, in 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.

APENDIX B: INTERVIEW QUESTIONS

Mymoena Sharif

A framework for e-skills policy-making in South Africa

Interview questions

1. Can you please explain your understanding of the current high level e-skills landscape SA?
2. Are you aware of any e-skills policy in the country? If yes, which one/s?
3. In your opinion, with e-skills policy interventions are needed in South Africa?
4. What do you think should be the key elements of an e-skills policy and why?
5. Will you please give your opinion regarding the role/significance of the following factors in e-skills policy-making in the South African Context:
 - a. Context-related awareness;
 - b. Collaborative e-skills ecology;
 - c. Excellence education for all;
 - d. Futures of ICT capabilities and knowledge infrastructure;
 - e. Research and development;
 - f. Monitoring and evaluation;
 - g. Cost and affordability;
 - h. E-inclusion
6. Who, in your opinion, are the world leaders in having developed and implemented their e-skills policy and what are strong/weak points of their policies?

APPENDIX C: EXCERPT FORM SELECTED INTERVIEWEES

Question: Can you please explain your understanding of the current high level e-skills landscape in SA?

Response1:

It is important to note that what happens in business is that people find their way. They are not necessarily going to wait for a policy before they act.

The biggest challenge facing South Africa is that of leadership or lack thereof. This is true for all stakeholders not only government. The ability for all stakeholders to place themselves on a timeline is a big challenge and as a result lack of perspective as to where they are going.

Public: In most instances people help themselves. Having said this there is however no clear understanding or thinking of e-skills and the benefit of being e-skilled. People still think about a computer.

Culturally: We have been adopting technology that has been sold to us by clever sales people. Hence we are unable to translate the technology for local benefit. Too many people selling devices.

In light of all the above, there is an absence of a broad e-skills policy FRAMEWORK to fit the elements together.

Response 2:

It seems that the high level of landscape in South Africa is still characterised by fragmentation...it seems that there is a number of scattered initiatives that are yet to be brought together...

e-Skills Institute is well positioned to bring initiatives and stakeholders together and, it seems, that things are slowly but surely coming together...what is necessary... is

to take a stock who provides skilling and who needs skilling ... in order to successfully prepare the nation for new era...

SA needs a comprehensive approach to skilling and this certainly include national plan of action (which we have) but also a number of e-skills policies, which we currently do not have...

Question:In your opinion, what e-skills policy interventions are needed in South Africa?

Response1:

Firstly, any e-skills policy must be holistic and be supported by national legislation for example the PFMA must support Skills Development and the Skills Development cannot operate in a vacuum. Need to revisit the roles of SETAs and the alignment of all e-skills related initiatives.

Private Sector including the ICT Sector and State Owned Companies: Must find ways to created organisational shifts in the private sector and that of State Owned Companies. Human Resource departments of these institutions have a major role to play.

The generational dimension is also important i.e. young people are not always heard. Those making policies are much older and lacks the understanding of the technology and the future (visionary).

Response2:

First of all, we need policies that will support the execution of the national plans of action... we have NeSPA 2010 and will soon have new NeSPA with many different recommendations...so we need policies that will force these recommendations or help rectify, for example, skew execution of NeSPA 2010...

For example, we need policies that will make the multi-stakeholders cooperation better and more effective – this is particularly important at the provincial level...I mean, at the level of e-skills hubs or co-labs as they are called now...there is a

number of small businesses or NPOs that will come on board but we still do not have a precise mechanism of how to do so...and here is, for example, opportunity for a good policy-making...

Question: Will you please give your opinion regarding the role/significance of the following factors in e-skills policy-making in the South African Context:

- Context-related awareness;
- Collaborative e-skills ecology;
- Excellence education for all;
- Futures of ICT capabilities and knowledge infrastructure
- Research and development including innovation;
- Monitoring and evaluation including that of aggregation;
- Cost and affordability;
- e-inclusion;

-
- **Context-related awareness;**

Response 1:

Awareness is crucial for a successful policy implementation interventions especially if one is targeting society at large.

Awareness should be linked to vision and benefits not just the definition of what is an e-skill.

Response 2:

This is simply step number one. And it seems that we still need to get there...many potential stakeholders are still outside of the organized e-skills loop.

- **Collaborative e-skills ecology;**

Response1:

In my opinion "Collaboration" in South African is very different to that of the developed world. Yet we understand the importance of bring all the key role-players together to bring about a new life-style with technology at its core.

What is challenging however is that the younger generation understands the importance of working in groups etc. and thus from a learning perspective

makes it very difficult to mark them individually. More and more communities of practices are emerging.

Also important to note is that “white” folk is currently dominating this space, big question is how to broaden diversity.

Response 2:

I agree with what is suggested in NeSPA 2010 about importance of a collaborative ecology – it is crucial that all stakeholders come together to the party and do some collaborative work – otherwise doing things in isolation will not help us to prepare this nation for new society and economy...

- **Excellence education for all;**

Response 1:

Can be achieved in South Africa but only over a long period of time.

The reality of our diversity must be taken into account. We are still dealing with issues of our past i.e. Apartheid.

Going forward we have to located education with a new context i.e. think of an “e-world”; best society where it is more valuable to have one computer than no computer in schools, community centres etc.

Response 2:

Essential... but it seems we are still far away. In my opinion it is very systemic problem and cannot be rectified by e-skills policies only. But e-skills policies might influence decision-makers in education to do something in regard to decent education for all our children.

- **Futures of ICT capabilities and knowledge infrastructure;**

Response 1:

Important for us to imagine a future where knowledge and information can play a different role. For examples: Schools in terms of learner assignments. Students “2-3 years” expectations of teachers. Parents have to play a role in how to get information and judge information.

Need for some to interpreta timeline for example 2008 - 2009: smart phones; tablets using few things to explore new ways to doing things in the future.

Find mechanisms to leverage ICT investments made locally and nationally by all stakeholders for the benefit of the society as a whole.

Response 2:

Having an appropriate knowledge infrastructure is highly important for building Knowledge economies or even whole Knowledge Society...and, of course, exploring new technologies and how things are possible done by using these technologies is vital for e-skills interventions. Technologies are changing so quickly making our skills obsolete in not time...so keeping pace with these changes and having good knowledge infrastructure will help in making sensible e-skills policies.

- **Research and development including innovation;**

Response 1:

More comparative studies should be encouraged and include other African countries such as Kenya. Funding mechanisms to allow for technology foresight research...Building an e-skills research base is critical for the country.

Response 2:

There is no innovation without proper research and development. But it is often costly...funds must be allocated and, equally important, people must be capacitated. Being young research discipline in South Africa, e-skills still has tiny research base so it is important to grow it quickly and steadily. And innovation will be the next step...For now, innovation can only come as a nus-product...

- **Monitoring and evaluation including that of aggregation;**

Response 1:

Need more local evidence. Local evidence will become more and more critical in decision-making and planning for a bright future. Mechanisms and process to support analysis of big data will be critical - a role for local universities.

Supply vs demand studies to track progress and gaps will influence policy-making.

Response 2:

We have declared that we are no longer interested in output and outcome only but also in impact of an e-skills intervention. So, we need to monitor and evaluate. And not just that. We need to M&E aggregated effort and resources if we are to try to determine impact of our interventions. But before M&E, we have to really aggregate resources and effort of that we can aggregate data and determine what happened at the end of the day.

- **Cost and affordability;**

Response 1:

No longer seen as a major hindrance. People will find ways once they have established the benefit of the technology. There is however a major role to leverage the USAASA investments made throughout the country.

Response 2:*I believe that we have still to work hard before we achieve affordability of technology, skills and usage. It seems that prices are going down but it is still hard for many people to buy a decent piece of ICT equipment – and also difficult to pay data bundle to use it...*

- **e-inclusion:**

Response 1:

Firstly there is a need to unpack what is meant by “e-inclusion”. Once the understanding is reached they i.e. businesses, individuals and government will find it easier to identify the required actions steps over a period of time. The role of advocacy in building an e-inclusive society cannot be over stated.

Response 2:

Apart for the fact that e-inclusion or digital inclusion is a pre-requisite for building knowledge society and economy, the newest studies show that there is no good e-government, no good electronic service delivery without e-inclusion of all citizens...and, we know, service delivery is still big problem in this country. E-inclusion must become highest national strategy not just nice word to use. So, e-skills policies must seriously take into account this idea. In fact, e-skilling people is a vital part for achieving nation-wide digital inclusion.

