THE UNIVERSITY OF THE WESTERN CAPE

A study of e-astuteness and e-social astuteness and their perceived validity amongst Information Systems (IS) students at a University in the Western Cape

A thesis submitted in fulfillment of the requirements for the Master's degree in Information Management in the Faculty of Economic Management Sciences of the University of the Western Cape

by

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Abstract

E-astuteness and e-social astuteness are relatively new concepts. As a result, there is little to no extended knowledge on how each of these concepts can be fully adopted and implemented in South Africa. This research extends on the literature on these two concepts. The research looks at what Information System (IS) students' perceptions reveal or suggest about the effective ways of adopting these concepts. The information gathered for this study can be considered as a starting point for further exploring how e-astuteness and e-social astuteness can be acquired in the South African. For studying perceptions, a qualitative research design was followed and i an interview guide was used. The study findings were summarised into sections, themes and sub-themes that conveyed a common point of reference.

The findings of this study suggest that teaching and learning should focus on the individuals being taught, hence the proposed adoption model that centers on the individual's capabilities. None of the students interviewed had an understanding of e-astuteness and e-social astuteness. The findings also revealed that fewer students have an understanding about e-skilling concepts in general. However, after the concepts were explained to the students, the findings suggested that they had a clear understanding of the importance of e-astuteness and e-social astuteness in South Africa. As a result it is empirical to first educate about e-skilling concepts before teaching the actual skills.

The proposed adoption model was accepted by students as the ideal model of adoption for e–astuteness and e-social astuteness. However, based on the themes and subthemes that emerged from the student's responses, the model was improved in order to reflect their perceptions. This research suggests that the South African government in the efforts to address the e-skills issue in the country needs to continue funding ICT and ICT education. With hope that through having ICT competent individuals, this will ultimately in turn curb the pressing issues that the country experiences, such as high level of unemployment and poverty.

Keywords

E-astuteness

E-social astuteness

Adoption model

Information Systems

Teaching and Learning

Information and Communication Technology (ICT) skills or E-skills

Student's perceptions

Semi-structured Interviews

Qualitative Research

Declaration

I declare that this study with the title **"A study of e-astuteness and e-social astuteness and their perceived validity amongst Information Systems (IS) students at a University in the Western Cape"** is my own work, that it has not been submitted before for any degree or examination at any other university, and that all the sources I have used or quoted have been indicated and acknowledged as complete references.

Signature Date

_____S.C Mlambo_____ _____October 2016_____

Acknowledgements

Firstly, I would like to thank my participants, without them there would be no study. Secondly, I would also like to thank my supervisor Dr Zoran Mitrovic for his patience and knowledge throughout this whole research. I would also like to thank my co-supervisor Dr Johan Breytenbach for his willingness to assist and for attending to my last minute requests. If it wasn't for their continuous support this work would have not come to fruit.

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1 CHAPTER 1: INTRODUCTION

1.1 Research Background

The birth of e-astuteness and e-social astuteness in South Africa

The skills issue in South Africa (SA) continues to be hard to address, especially since the country is still faced with competency based problems such as illiteracy and unemployment. However, in the past five years, ICT skilling (e-skilling) has been one of the South African Government's top priorities. Hence the establishment of the e-skills summit which was a result of a combined effort by the Information Society Institute (TISI) as a service delivery partner of the e-Skills Institute (eSI), to assist in building a basis for *'e-skilling the Nation*'.

The country's noticeable drop on the World Economic Forum (WEF) global *e-readiness* 2012 rankings from 47th place in 2007 to the 72nd spot in 2012 came as a wakeup call for South Africa. An indication that action is needed in the spaces of the information and communication technologies (ICT) infrastructure development, and that previous effort had simply not been enough to prepare the society for a socio-economic reality dominated by new powerful mobile ICT devices (NeSPA, 2013). For a society to be ICT ready (e-ready) it needs the necessary infrastructure such as high bandwidth internet, connectivity reliability, and affordability. Furthermore, ICTs are used in everyday life, hence they need to be taught in schools among the other school subjects (Vaezi and Bimar, 2009). As a result, the e-Skills Institute of South Africa and Research Network for e-Skills (ResNeS) colloquium was established in an effort to address the challenges facing e-skilling in the in the country (NeSPA, 2013).

The concepts of ***e-astuteness and e-social astuteness*** are promoted, by mentioning how they can be embedded in a societal capacity development through the National e-Skills Plan of Action (NeSPA, 2013) – by identifying how they can be embedded in a societal capacity development through the utilization of the learning centres, also known as the e-centres. These e-centres are expected to harness the skills interests of formal and informal learners and prepare them for modern Information Society and Knowledge Economies (also referred to as Knowledge Society).

1.2 Research Problem

People these days rely on ICT to participate in an environment that is dominated by increasing access to mobile devices and electronically-enabled information. The speed at which technology changes requires skills to be constantly updated (Mitrovic, Sharif, Taylor & Wesso, 2012). A slippage of South Africa on the e-readiness rankings has suggested to the country's policy makers, government officials and private organisations that the country was in dire need of a vigorous e-skills human capacity development plan.

A new approach to e-skilling was identified as e-astuteness and e-social astuteness (NeSPA, 2013; Mitrovic, Taylor, Sharif, Claassen, & Wesso, 2013). The approach was generally agreed on by over 350 national and international delegates at the 2nd e-Skills Summit and the International Telecommunication Union (ITU) Global ICT Forum on Human Capital Development. This agreement resulted from a realization that concepts such as e-astuteness and e-social astuteness were needed to help people successfully apply e-skills in order to benefit in their everyday life: employment, business, educational or social activities (Ijeoma, Joseph and Franca, 2010).

The National e-Skills Plan of Action (NeSPA, 2013) distinguishes e-astuteness and e-social astuteness as the skills needed to support the National Development Plan (NDP) priority areas. However, there is no evidence that these concepts have been empirically tested. As an attempt to gain a better understanding of the concepts, the proposed research explores the perceptions of plausibility of these concepts amongst students in a South African university. It was foreseen that the student's perceptions obtained from this study would provide a form of actionable feedback that could inform practice on how these concepts can be effectively adopted. The literature review focuses on skills associated with the concepts and an ideal approach to adopting these concepts. The research findings reveal the students' perceptions regarding these concepts and how they can be adopted and integrated in the South African teaching and learning environment.

1.3 Main Research Question

The question that is attempted to be answered through this research is as follows:

> *What are Information Systems (IS) student's perceptions about e-astuteness and e-social astuteness, and what do these perceptions reveal about an effective adoption approach of these concepts?*

Sub Research Questions

In order to answer the main research questions, the following sub research questions are attempted to be answered:

1. What is e-astuteness and e-social astuteness and the skills associated with these concepts?
2. What are the Information Systems students' perceptions when it comes to e-astuteness and e-social astuteness and how familiar are students with these concepts?
3. What are effective approaches for adopting e-astuteness and e-social astuteness?
4. What do students' perceptions of e-astuteness and e-social astuteness reveal about the effective approach for adopting these concepts?

1.4 Research Objectives

The objectives of this research are:

- To explore the concepts of e-astuteness and e-social astuteness by identifying the facets of these concepts, and the skills associated with the concepts.
- To explore ways in which the concepts of e-astuteness and e-social astuteness can be adopted in South Africa as well as in the teaching and learning environments at a South African university.
- To explore Information Systems students' perceptions of e-astuteness and e-social astuteness and the adoption of these concepts.
- To propose an adoption model for e-astuteness and e-social astuteness.

1.5 Delimitation of the Study

This study focused to explore ways in which the concepts of e-astuteness and e-social astuteness could be adopted in a South Africa. However, the study was conducted at a single University in South Africa and even though the findings may be applicable to a South African university context, the findings cannot be generalized to the whole of South Africa.

1.6 Research Design

1.6.1 Selected methodology

Over the past few years there has been a shift In Information Systems research, namely a shift away from technologies and more towards managerial and organizational issues. This brings an increase in qualitative research methods along (Myers, 1997). In an article quoted by Kaplan and Duchon (1988), it is eluded that a qualitative approach develops an understanding of the perspectives of the participants and modifies that understanding through cycles of data collection and analysis, until coherent interpretation is reached. A qualitative research approach entails understanding people from their own frames of reference (Taylor, Bogdan & DeVault; 2015). Therefore, a qualitative approach was more suitable in attaining the students' perceptions regarding e-astuteness and e-social astuteness.

According to Myers (1997) the qualitative research method was originally developed to study social culture and examples of qualitative methods would be action research, case study research and ethnography as well as grounded theory

Case study research methods are better suited for studies from which existing theory seems inadequate, and these methods are especially useful in research topics where fresh perspective is needed (Eisenhardt, 1989). A case study is chosen for this research to develop general theory from the students' perceptions around how the concepts of e-astuteness and e-social astuteness can be adopted. Because there is little to no known knowledge about these concepts, Yin (2003) identified one of the context into which case study methods should be used as when the boundaries are not clear between the phenomenon and context. Yin categorizes case studies as *explanatory, exploratory, or descriptive.*

A *descriptive* design was used as the study aim was not only to properly define the concepts but also to determine what the students' perceptions reveal about the effective way of adopting of e-astuteness and e-social astuteness. It was envisioned that by identifying the perceptions of students on the concepts of e-astuteness and e-social astuteness this may be useful in finding an effective way of adopting these concepts. The study also included a literature review to determine how perceptions relating to the adoption and use of ICT can influence the adoption of e-astuteness and e-social astuteness.

1.6.2 Data collection techniques

It is known that there is no right or wrong ways when it comes to conducting research using qualitative methods, however to certain types of studies, some approaches are more conducive than others (Guest, Namey and Mitchell, 2013). In the human sphere, gathering "deep" information and perceptions is done through qualitative methods such as interviews, discussions and observations of the participants (Lester, 1999). In support of this, the Qualitative Research Encyclopaedia of Statistics in Behavioural Science by Patton (2005) states that; "*Qualitative research analyzes data from direct fieldwork observations, in-depth, open-ended interviews, and written documents. Qualitative researchers engage in naturalistic inquiry, studying real-world settings inductively to generate rich narrative descriptions and construct case studies".* However, Berg, Lune, H., & Lune, H. (2004) highlight that any information that the investigator gathers has a potential of answering the research questions or solve a particular problem. The author's further highlight that the best way to gather qualitative data is dependent on the nature of the problem to be studied and the limitations thereof.

Britten (1995) elaborates that it should be the interviewer's responsibility to explore what the participants mean in as much detail as possible, and expose what was not initially anticipated at beginning of the research.

Information Systems students were selected for this study because of the assumption that they would understand the interview question asked. However, this

is not to be confused with selecting Information Systems students in order to provide preconceived or predetermined answers to the interview questions.

Perceptions of students were expected to differ depending on each student's exposure and experiences with ICTs. However e-astuteness and e-social astuteness go beyond the mere use of ICT's but about being able to gain e-skills. Face-to-face interviews with Information Systems students were a preferred method for gathering the student's perceptions.

1.7 Research Contribution

This study contributes to the little knowledge on the concepts of e-astuteness and e-social astuteness. This research can be used by the South African government as a basis to drive e-astuteness and e-social astuteness adoption in South Africa. Furthermore, the e-skills identified to be linked to these concepts may be a focus for universities when structuring their curriculum.

1.8 Ethical Consideration

The researcher received written consent from all participants before conducting the interviews. Confidentiality and anonymity of research participants as well as the institution where the research was conducted were respected. The participants were informed about the aims of the research and the sort of questions they would be asked as well as how long the interviews would take.

The research study was conducted voluntarily while ensuring that no harm was inflicted on participants. All necessary clearance and permission to conduct the study were obtained from the University's Ethics Clearance before commencing with the research.

1.9 Definition of Key Concepts

Terms	Definitions
e-astuteness	The capacity to continuously appropriate the technology into personal work, education, business, social and family contexts for both personal and collective benefit. e-Astuteness is defined as a knowledgeable capacity, based on personal and interpersonal skills, that involves: • Understanding people and situations • Building alignment and alliances • An acute understanding of strategic direction • Applying strategic behaviour *(iNeSI, Edition 26)*
e-social astuteness	The use of ICT and e-skills for more astute ways to interacting with others, which include: • Social interactions • A level of awareness and understanding of diverse social situations • The various alternatives open to them for response *(iNeSI, Edition 26)*
Adoption	Adoption comes from the old French word *adoptare*, meaning "to choose for oneself" (http://www.vocabulary.com/dictionary/adoption). It the context of this thesis it refers to the act of positively taking on and acquiring e-skills that one is able to use in their everyday lives to make life easier not only for themselves but also for the people around them. It involves understanding e-skills that can be linked to e-astuteness and e-social astuteness and incorporating them in one's daily life. Ultimately being deemed e-astute and e-social astute.
ICT skills/ e-skills	*E-Skills* are defined in this thesis as the ability to not only use, but also develop Information and

	Communication Technology (ICT) within the boundaries of the country's emerging information society and global knowledge economy (iNeSI, 2014).
Teaching and learning	In the context of this research, teaching refers to the process of conveying knowledge from one person (the teacher) to the next. Whist learning refers to the process of acquiring what has been taught, not necessarily reciting and recalling what has been taught but being able to apply the knowledge in everyday life.
Participant/s	The students that took part in this research study

Table 1: Definitions of Concepts

1.10 Chapter Outline

In Chapter 1, the topic, purpose and significance of the research study are presented by expressing the importance of having an understanding about the concepts of e-astuteness and e-social astuteness.

Chapter 2 focuses on the literature review on e-astuteness and e-social astuteness. The skills that can be linked to e-astuteness and e-social astuteness are identified and existing e-skilling approaches, strategies and policies in South Africa are reviewed. Furthermore, chapter 2 identifies the facets of e-astuteness and e-social astuteness and a holistic approach to adopting these concepts.

Chapter 3 covers the research design and methodology used in this study. It further elaborates on the data collection methods, the sampling techniques as well as the process for conducting the interviews.

Chapter 4 discusses the results of the interviews that were conducted. The findings are represented through themes and subthemes that emerged from the responses. This chapter also revisits findings that were obtained from the literature review in order to either support the theory that was generated in this chapter or create new knowledge.

Chapter 5 revisits the research objectives, identifies the research contribution and outlines the limitations of this study. Final recommendations are made based on the research findings.

This is followed by a list of references that were used in this research.

2 CHAPTER 2: LITERATURE REVIEW

2.1 Introduction

The purpose of this chapter is to provide clear definitions of the concepts of e-astuteness and e-social astuteness. The researcher aims to properly give definitions to these concepts and identify the skills that can be associated with them. In essence, the objectives to which this section seeks to expand on are as follows:

- To explore the concepts of e-astuteness and e-social astuteness by identifying the facets of these concepts, and the skills associated with them.
- To propose an adoption model for e-astuteness and e-social astuteness.

Generally, except for the work of Mitrovic *et al.* (2013), the reviewed literature does not offer articles on either e-astuteness or e-social astuteness. This prompted the author to search for concepts related to these two notions.

2.2 Defining e-astuteness and e-social astuteness

E-astuteness and e-social astuteness are gaining popularity within the e-skills agenda in South Africa, especially in achieving socio-economic development and preparing the country's citizens for 'equitable prosperity' and 'global competitiveness" (NeSPA, 2013). These concepts are described by the National e-skills Plan of Action as enablers in achieving the National Development Plan (NDP) priority areas (National Integrated ICT Policy Green paper, January 2014). E-astuteness and e-social astuteness have been viewed within the bounds of possibility by the e-skills Programme and supported by the Department of Communications and the e-Skills Institute (e-Skills Summit South Africa, 2012) delegates. However, e-astuteness and e-social astuteness have not yet been fully supported by the relevant theoretical clarity in academic literature (Mitrovic *et al.,* 2013). Hence, a rising need to propose a distinct definition of the concepts of e-astuteness and e-social astuteness.

According to the Ikamva National e-Skills institute (iNeSI) (27th Edition), e-astuteness can be described as "The capacity to continuously appropriate the technology personal work, education, business, social and family contexts for both personal and collective benefit." Moreover, e-astuteness and e-social astuteness

enables individuals to develop capabilities and attitudes which allows them to effectively use e-skills, develop e-competencies and possess the relevant ICT-related knowledge and the skill to apply this knowledge (NeSPA, 2013; iNeSI Edition 28, 2014). The sentiment expressed in this definition, embodies the view that, an e-astute individual will possesses the ability to use information and communication technologies (ICT) proficiently, which is identified by the European Centre for the Development of Vocational Training (CEDEFOP) as digital literacy (Tissot, 2004). Furthermore e-astuteness enables individuals to take full advantage of ICT through the appropriation of the relevant e-skills, thus resulting in a shift from ICT infrastructure to e-skills development (iNeSI, Edition 24; iNeSI, edition 25). However, it does not necessarily require one to have a formal education or to have high literacy levels in order to be e-astute (Mitrovic *et al.,* 2013).

In similar light, e-social astuteness involves the use of ICT and e-skills for astute ways of people interacting with each other, and thus being able to apply the relevant e-skills in situations for equitable personal and communal socio-economic development (Mitrovic *et al.,* 2013). As a central focus, both concepts embed an understanding of (1) acquiring the correct e-skills and general skills, (2) identifying where those skills can be applied and applying these e-skills in our everyday lives and (3) understanding the benefits that one can achieve from using these skills and leveraging from these benefits.

2.2.1 The skills associated with e-astuteness and e-social astuteness

In an effort to record possible characteristics, skills and traits of e-astuteness and e-social astuteness the concepts will be broken down into key words; *"astuteness"* , *"social astuteness"* and *"e"* in order to discuss them in detail.

The concept of *astuteness* is related to a number of definitions from various sources as mentioned by Mitrovic *et al.,* (2013). These sources include; The *Longman Dictionary of English Language and Culture* (1992), which defines *astuteness* as "*being clever* and able to see quickly something that is to one's advantage" and *The Oxford Babilion Dictionary* (2012), which defines it as "*clever; keen, acute, bright; shrewd; perceptive"*. *Socially astute* individuals are often seen as ingenious, and clever in dealing with others (Ferris *et al.,* 2005), however, in a political context (i.e.

the political facet of e-astuteness and e-social astuteness), social astuteness is identified to be one of the dimensions of a political skill, and having the ability to understand situations and people (Momm, Blickle and Liu, 2013).

According to Moss and Barbuto (2010), *Social astuteness* can be described as an *interpersonal skill* which allows one to interpret and effectively react to work situations. Furthermore socially astute individuals have a *social skill* which allows them to be aware of ways in which they can communicate with others

The ikamva National e-Skills Institute defines *e-astuteness* as:

"a *knowledgeable capacity*, based on *personal and interpersonal skills"* in their 2014 edition (i.e. The psychological facet of *e-astuteness and e-social astuteness*).

Introducing the "e" in astuteness and social astuteness: A relationship with e-skills and ICT skills

Given, that this thesis is based on an e-skilling perspective, it is therefore important to note that it also refers to the "e" in an e-skills context. Within a South Africa, *e-skills* is defined as the ability to not only use, but also develop ICT within the boundaries of the country's emerging information society and global knowledge economy. E-skills enable individuals to actively participate in all areas of life, which include; government, business, education and society in general (iNeSI, 2014). Equally important, the European *e-skills* Forum (EESF, 2004) defines e-skills as: "…t*he ability to develop and use ICTs within the context of a knowledge environment and associated competencies that enable the individual to participate in a world in which ICT is a requirement for advancement in business, government and civil society".* It is important to note however, that more often the terms *e-Skill*s, *digital competencies* and *ICT skill*s are used interchangeably. Mitrovic *et al.,* (2014) defines the "astute" use of e-skills for personal growth and self-reliance as *e-astuteness* and the collective development through use of these ICT skills as *e-social astuteness* respectively. Furthermore, *Mitrovic et al.,* (2013) highlight that *e-astuteness* involves;

"... *Creating a mind-set that embraces all forms of technology and prepares users for future forms of technology and their possible socio-economic applications' of other skills*

2.2.2 The facets of e-astuteness and e-social astuteness

The *Oxford Dictionary* (2014) defines 'facets' as "one side of something many-sided" or "A particular aspect or feature of something", while on *The American Heritage Dictionary of the English Language* facets is defined as "one of numerous aspects, as of a subject". This research identifies the first facet of *e-astuteness and e-social astuteness* as the '*political facet'* (i.e. through which the concept of *astuteness* was *popularized as a 'political skill'*) which was seen as a sign of intelligence/wit in politics. Parales-Quenza (2006) highlights that even though In Spanish, *astuteness (astucia*) carries a meaning of deceit and lying, whilst in English it carries a meaning of understanding and intelligence, the meaning in both languages refers to an *intellectual capacity*, a state of mind.

The second facet is identified in this research as the *psychological facet* (i.e personal and interpersonal skills). *Astuteness* as emphasized in professional literature is identified as "the skill of planning to achieve goals" (Parales-Quenza, 2006). However, the author also notes that it also appears at an intersection between mind and culture; presupposing the evolution of human intelligence on one side, while it depends on social coexistence on the other side. This section of the research aims to further discuss the psychological facet of *e-astuteness and e-social astuteness* with the aim to discuss the theories and teaching models that will help establish a base on how these concepts can be adopted.

The Psychological facet and its interdependence with interpersonal and personal skills

There is no obvious and no one definition of Psychology (Haaga, 2004), as a matter of fact, in an article quoted by Reber (1995) he suggests that the term 'psychology' is often used as an attempt to understand what is beyond ordinary people's understanding in an effort to suggest that something is known about that knowledge.

One might argue that there is somehow a link between interpersonal skills and personal skills as each might influence the other. *Personal skills* are defined as those skills that make up an individual's personal characteristics (i.e decision making, communication, team working skills, problem solving) (Bennett, 2002). An individual's personality and human relations skills (the ability to communicate) along with ongoing awareness of one's feelings, attitudes and values all form a component of what is known as personal skills (Fisher, 1991). *Interpersonal skills* on the other hand also known as *inter personal relations* are understood as those skills that are required for a person to communicate with others, often having an outcome of being able to emotionally engage with others.

Sometimes it requires one to truly understand themselves before they can understand others, while in other cases understanding others can help individuals understand themselves. Gammie Gammie and Cargill (2002) points out that both personal and interpersonal skill incorporate communication and team work skills, thus the requirement for team players, as well as team-leaders.

Social astuteness denotes the importance for one to understand the social surrounding, situations and behaviors of others (Ferris *et al.,* 2007; Momm, Blickle & Liu, 2013), similarly astuteness in politics is often seen as a political skills comprising of a positive characteristic such as wit and leadership competency (Parales-Quenza, 2006).

Leadership Theories and the interdependence with e-astuteness and e-social astuteness

The concepts of e-astuteness and e-social astuteness embrace leadership as one of the important elements vital for an individual success. Existing research on e-astuteness and e-social astuteness, such as that of Mitrovic *et al.* (2013) and NeSPA (2013) displays leadership as among the essential components in building an individual's e-astuteness and e-social astuteness capabilities apart from social skills and ICT skills. As an attempt to fully understand what 'leadership' means, there has also been countless number of leadership models developed based on different theories over the past years. In addition to these models, several leadership

philosophies, traits and styles have been established, which contain ideas of how leaders should behave and act. Leadership models such as the Trait Based Theory; Behavioral Theories; Contingency Theories and the Great Man Theory have all seen popularity and scrutiny over the years.

However, in this study it is suggested that e-astute and e-socially astute individuals are situational leaders hence the focus on the *Situational Leadership Theories (SLT*) on this section.

The concepts of e-astuteness and e-social astuteness lay the assumption that to be e-astute one needs to - firstly, have leadership characteristics and secondly have some sort of situational awareness. The SLT lays an assumption that the best action of a leader depends on a range of situational factors, thus believing that an effective leader does not have a single style of leadership. In essence, the theory suggests that the leader effectiveness is as a result of a joint function between a leader's behavior and the situational requirements instead of being a function of leader behavior alone (Vecchio, Bullis and Brazil, 2006).

The Situational Leadership theory model was developed by Hersey and Blanchard (1969) after being known as the as the "Life Cycle Theory of Leadership". In the late 1970s and early 1980s Blanchard introduced the Situational Leadership II model which focused on a leader's competence levels, based on the levels of development i.e. skills, abilities, knowledge. As mentioned previously that being e-astute is not dependent on formal education, however there is greater emphasis on the individual's ability to adapt to the changing environment and the evolving needs of the economy. Despite some criticism on the (SLll) model, the theory's main emphasis is on the importance of a leader's ability to adapt to the changing environment, which also forms the basis for this research.

The conceptual models of e-astuteness and e-social astuteness – as shown in Mitrovic *et al.,* (2013) depicts personal and interpersonal competencies as the main pillar in building e-astuteness. The models emphasize the importance of knowing oneself and local cultures (people and situations). This research extends on both models by showing development and maturity levels of e-astute individuals *(see Figure 1).* This research does not fully support the Hersey-Blanchard Situational Leadership theory. However, it does identify the importance of considering

developmental and maturity levels of individuals in e-astuteness and e-social astuteness building.

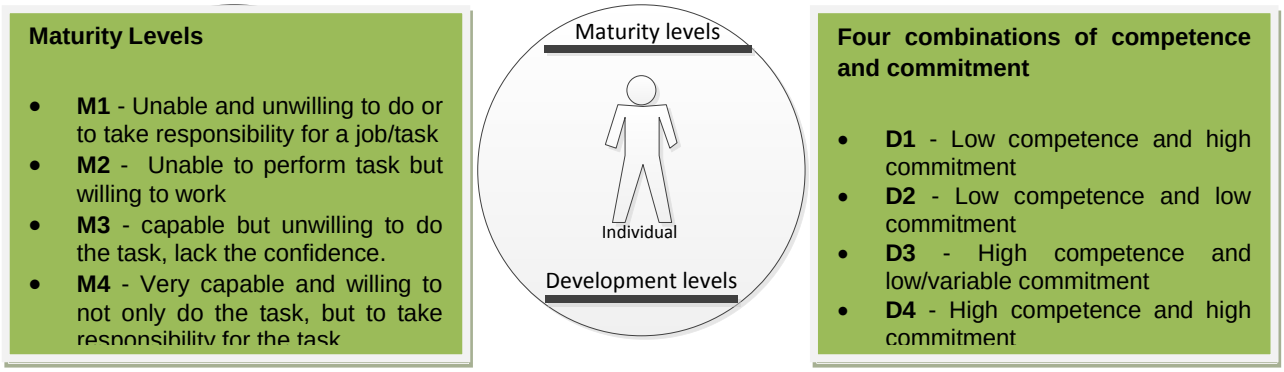

Figure 1: Development and maturity levels in e-astuteness and e-social astuteness (Based on Hersey-Blanchard maturity and developmental levels)

The Hersey-Blanchard Situational Leadership Theory identifies four levels of maturity; these are identified above on the model as M1, M2, M3 and M4. This research suggests that it is important to acknowledge that individuals possess different levels of maturity and development when it comes to e-astuteness adoption. These different levels of maturity and development will determine how individuals respond to a specific situation. Some people are mature enough and willing to take responsibility for a job or task (M4) while others may not be as mature and unable or unwilling to take responsibility for a job or task (M1). Hersey-Blanchard describes four developmental levels (D1, D2, D3 and D4) in terms of "competence" (ability, skills and knowledge) and "commitment" (confidence and motivation). As with maturity levels, the commitment and competence levels of an individual may vary. One person may have high commitment but low competence (D1) while another may have High competence and Low commitment in a task (D3). On the other side of the spectrum there are people that will show low competence and low commitment (D2) whilst others may show high competence and high commitment (D4) to performing a task or job. This model also suggests that competence and commitment may change due to time and/or experience. This change may vary among individuals as some individuals may be naturally talented. Sometimes people find themselves in difficult

situations, that they cannot control. However, e-astute and e-social astute individuals are leaders and are able to use the skills and resources and the options available to take themselves out of those situation. E-astute and e-social astute individuals have the ability to not be paralyzed by those situations.

2.3 The road towards e-astuteness and e-social astuteness

Concepts referring to the use of ICTs (i.e. e-skills) have gained popularity in South Africa, more especially to address the country's dire shortage of e-skills. The country has an estimated shortage of 70 000 e-skilled people (Sharif, 2013; Plaatjies and Mitrovic, 2014). As a result, the South African government recognizes the role of e-skills as a much needed solution in improving our socio-economic landscape (Mitrovic, Taylor, Sharif *et.al*, 2013). The e-Skills Institute (e-SI) identifies and classifies four types of e-skills. Namely: *(1) ICT practitioner skills; (2) ICT user skills; (3) e-business skills and (4) e-literacy.* These e-skills classifications are further defined in *Chapter 4*. These concepts are widely adopted in ICT research and literature. However, as an attempt to gain full understanding of e-astuteness and e-social astuteness, an extensive look at approaches to e-skilling, policies and frameworks in South Africa follows. Viewing these approaches may contribute on how these concepts can be adopted.

2.3.1 A look into the e-skills landscape in South Africa

A study on the shortage of e-skills in South Africa, titled "*the e-skills landscape in South Africa*" published by Merkofer and Murphy in 2009 mentions the need for a collaborative approach between relevant stakeholders (government, industry and educators). The authors highlight that this collaborative approach is needed in order to effectively address the issue of e-skills shortage and transform the country's current ICT landscape. A similar approach to this one was also describe in the National e-Skills Plan of Action (2013). The authors further acknowledge that it is vital to focus on future skills for ICT professionals to compete in the global knowledge economy.

The multi-stakeholder collaboration focus can be seen re-iterated by the e-skills Summit. Furthermore, several publications including those by Mitrovic and Sharif (2012) and Sharif (2013) has been emphasizing this approach, with iNeSI citing this method as one of its primary component to global competitiveness.

2.3.2 E-skills adoption strategies, policies and frameworks in South Africa

ICT policy and strategy plans are instrumental in creating the right environment to adopt the use of ICTs (ITU, 2007). In 1994, South Africa developed several frameworks focusing on different areas such as telecommunications, broadcasting as well postal sectors (NICTP, 2014). However, in most recent years it became more apparent that if there was ever a chance for the country to leverage from the changes brought by ICT, the country's policies needed to be re-visited. Gillwald, Moyo and Stork (2012) identify that lacked efforts in implementing and follow up of policies has resulted in South Africa plummeting down international ICT indices. Over and above these policies, there was also a need for smaller initiatives that focused on achieving the desired outcome. In 2009, Merkofer and Murphy speak of a number of training initiatives that had been introduced to support the newly implemented strategies by the South African government to encourage development in ICT skills. Some of the initiatives identified were the *Meraka e-Skills Institute*; *Sector Education and Training Authority (SETA) initiatives*; *Skills Development Strategy for South Africa*, just to name a few. Below the author discusses a few of the policies and frameworks put in place by government.

National Development Plan (NDP) Vision for 2030

Released in November 2011, the National Development Plan focuses on eliminating poverty and reducing inequality through building capabilities, enhancing the capacity of the state and promoting leadership. When it comes to the Information and Communication infrastructure the plan envisioned that by 2030 the country needs to "…*underpin the development of a dynamic information society and knowledge economy that is more inclusive and prosperous*".

While the plan briefly outlines ICT skills that are projected for the future, it does mention the disappointment of the South African ICT sector compared to the rest of the world. Some of the barriers mentioned are limited capacity and limited expertise. However, this section does not mention its concerns about e-literacy. Although, it is foreseen that public services, information and educational products will be easily accessible by all. However, the need for human development cannot be ignored. In order for these individuals to take full advantage of the technological advances, e-literacy is of utmost importance. Furthermore, the NDP hopes to improve the quality of education, skills development and innovation by 2030.

National Integrated ICT Policy (NICTP, 2014)

The National Integrated ICT Policy (*Green Paper*) is a policy paper that aims to provide an overview of the landscape of the country's ICT development since 1994. This paper is the second produced following 'the Framing Paper' which was gazetted in April 2013 as part of the four phase ICT Policy Review Process. The ICT Policy Review Process is made up of the four chapters namely the *Framing Paper, National Integrated ICT Policy Green Paper, Discussion paper, National Integrated ICT Policy White Paper*. Among other things, the policy discusses the regulatory and legislative changes needed to ensure that the ICT sector in South Africa contributes actively to the economic growth of the country. The *Green Paper* "essentially asks questions on how the future policy framework can ensure that the country is able to meet its objectives and reap the full benefits of convergence" (National Integrated ICT Policy *Green Paper*, Executive summary). Similarly to iNeSI, the *Green Paper* stresses about the partnership needed from the civil society organisations, communities and individual experts for the reasons that the South African government does not have the capacity to address all these challenges single handedly. The *Green Paper* is directed at stimulating engagement on key issues around ICTs and ensures active public participation.

The paper covers broad based topics including enabling the environment for electronic communications, the impact of the digital age and the pressing issue of skills development (the demand and supply). The '*discussion paper'* which was

produced following the *Green Paper* focused on policy options and approaches introduced in the Green Paper and seeks input from the public.

The policies mentioned above are all vital for the country's success. However it is important to note that this research only mentions two of the many policies, initiatives and frameworks that the country has in place, such as NeSPA, Medium Term Strategic Framework (MTSF). If implemented and followed-up properly, these policies can be South Africa's recipe to fully leverage from the benefits of an ICT driven environment. With each of these policies, approaches and frameworks, a research element may be incorporated to allow collaboration for research and further extend on our understanding and to continuously revise them. One example would be iNeSI, as it has incorporated a research component known as National Research Network of e-Skills (ReSNES) to create a knowledge base through research.

2.4 A holistic approach to e-skilling

To start with establishing an effective method for adopting e- astuteness and e-social astuteness, South Africa should start with the existing approaches that the country has in place to address this need. It is acknowledged in this research that teaching people about these concepts is vital in adopting the concepts. However teaching alone will not allow South Africa to establish an e-astute and e-socially astute state as envisioned.

This section discusses the Ikamva National e-Skills Institute (iNeSI) as a governmental approach to e-skilling. iNeSI is a government initiative under the Department of Communication (DoC). According to the iNeSI website, the initiative is aimed at "*enabling environment for a coordinated response to the challenges posed by the rapidly-expanding capacity, mobility, convergence and affordability of new information and communication technologies (ICTs) and their impact on South Africa's competitive position*". iNesi is mandated to drive the development of e-skills capacity and creating an e-astute society. According to the iNeSI website the initiative's main focus is primarily on 4 components:

- Knowledge for innovation (research),

- E-astuteness (teaching and learning),
- Multi-stakeholder collaboration,
- Innovation and aggregation (monitoring and evaluation framework

Component	Description
Evident-based research	According to iNeSI this component is made up of several sub-components, namely: **South African based research** This section emphasises on the need for a South African based research that focuses on e-skills, particularly the supply and demand of e-skills and how to adopt the accompanying business skills; **New research approaches** iNeSI identifies new research approaches to address the impact of ICT for the country's success; **Policy development** Development of new policies and refining existing ones in order to match up with our demand for becoming a knowledge economy that fully enjoys the benefits of ICT.
Teaching and learning (e-astuteness)	INeSI shows that e-astuteness in itself is about teaching and learning efforts to e-skilling. There are four sub-components/ways in which this can be done, namely: **Filling the e-skills gaps** An effort to fill the gaps created by the demand of e-

	skills by embedding e-skills into the curriculum. Identifying the demand and filling this gap requires consultation with the iNeSI stakeholder community; **Collaboration and aggregation** Delivering e-skills through uncoordinated efforts by government, higher education, civil society and businesses. Making sure that the e-skills provide are aligned to what is reflected in the national priorities such as the NDP vision 2030; **Leveraging from existing resources** The country needs to use its current infrastructure, existing courses, ICT education and available training in order to e-skill the population; **Accredited Programmes** The country should focus on existing programmes that either focuses on re-skilling or up-skilling the citizens and their relevance; **Appropriate and innovation approaches** iNeSI identifies this category as possessing the capability to address systemic problems. One such way to address this would be to discover new ways in identifying pupils with potential even when they do not possess the required entrance qualifications; supporting all students including the ones that work at a slower pace, and introducing work-integrated learning such as problem based learning practical components into learning programs.
Innovation	The innovative component speaks of innovation as a driver **essential for knowledge production,**

	developing the nation and improving our competitiveness. **Building Innovation application factories** is one of the ways thought to improve our innovation and in turn increase this competitiveness**.** The factories focus on the development of locally produced applications that support the socio-economic need of the country. These factories benefit from the research and knowledge generated by the hub and also form part of the training agenda (curriculum) at universities giving the students relevant skills and knowledge of full application development. These factories allow for a free collaboration with the community, interested businesses which can assist in assessing the feasibility of the development of the applications. **New innovative ways of thinking** looks at innovation through a collaborative based approach. Innovation can be channelled through a multi-stakeholder approach consisting of global partners, universities and local businesses.
Monitoring and Evaluation Framework	This component focuses on putting **new tools** in place that measure the impact after the seamless integration and implementation of all the components mentioned above. Moreover, there will be a further need for an evaluation framework which aggregates the adoption of technology further within a society, further addressing the issue of supply and demand.

Table 2: Components of the iNeSI e-skilling approach

2.5 Towards e-astuteness and e-social astuteness – An adoption model

In this section the author introduces a way by which the concepts of e-astuteness and e-social astuteness can be adopted. The term *"adoption"* in this research denotes to the introducing and incorporating e-astuteness and e-social astuteness in everyday lives, notwithstanding our teaching and learning environment. It is important to note that teaching and learning takes place not only at university or within formal education, but also in our everyday lives. Humans continuously learn new things. Moreover, the author will also discuss how perceptions can influence the willingness to either learn about or appropriate these concepts in the teaching and learning environment and our lives in general.

This research suggests that the ideal model for e-astuteness and e-social astuteness should incorporate the combined efforts of e-skilling approaches and relevant policy in South Africa. Furthermore, to benefit from the collaborative approach that the likes of NeSPA, NDP (Vision 2030) and iNeSI envision, there should be a model that encompasses and shows how every individual or organisation fits into the bigger picture.

2.5.1 The adoption model explained

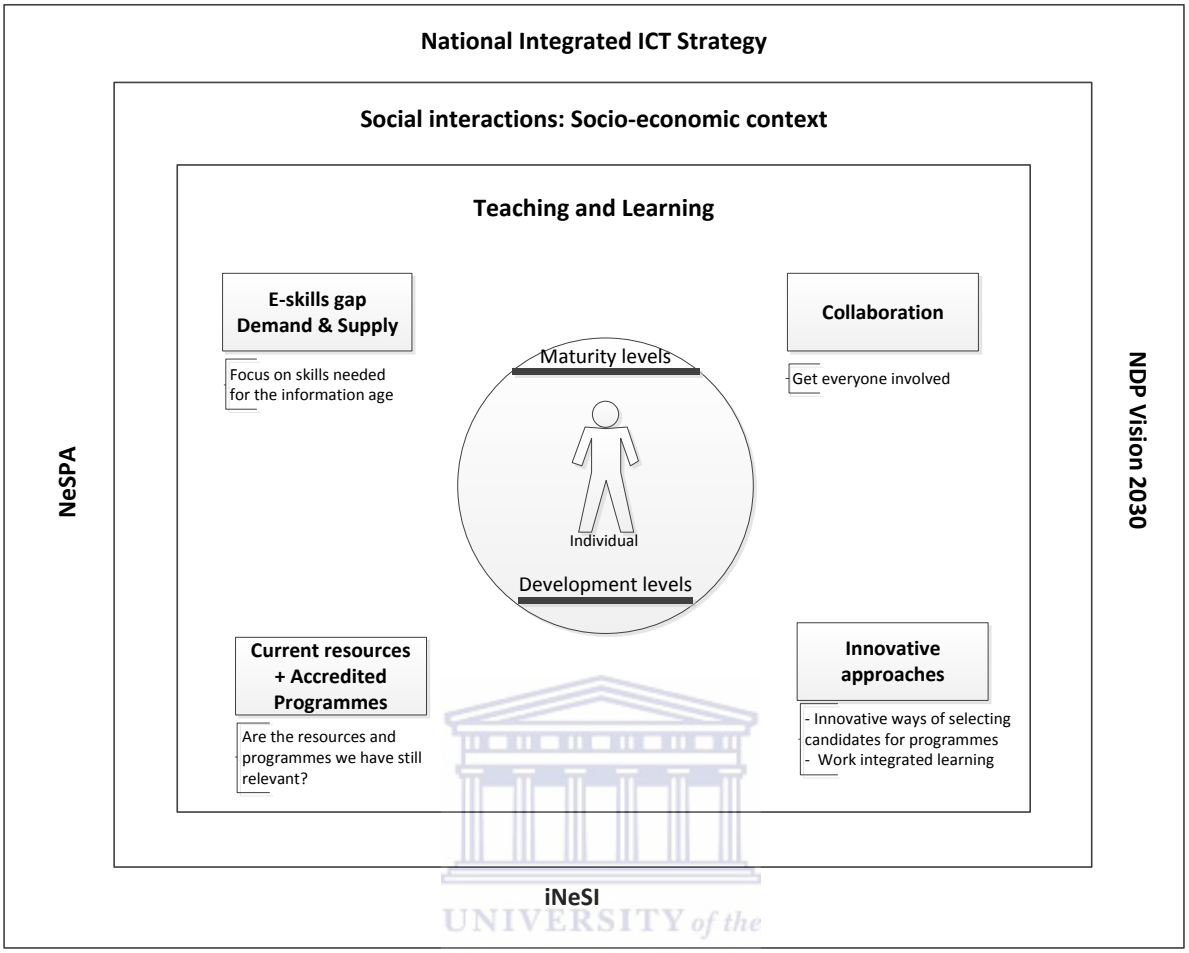

Figure 2: An adoption model of e-astuteness and e-social astuteness

In the center of the adoption model of e-astuteness and e-social astuteness, it is suggested that at the very core of the e-astuteness and e-social astuteness adoption model should be a focus on an individual's maturity and development levels, also referred to in this study as individual capabilities. Hence it makes reference to Hersey and Blanchard maturity and developmental levels *(see Figure 1 above).*

It further depicts that a *teaching and learning* effort that concentrates on these individual capabilities is necessary. This model acknowledges that each individual learns differently and at different paces. Thus, teaching and learning methods should not be a one-size-fits-all. iNeSI identifies-astuteness as a teaching and learning component to e-skilling, with sub components that cover*; filling the e-skills gap*, *collaboration*, a focus on *current resources and accredited programmes* and lastly the *innovative approach* (see further description of the components in *Table 2*

above). The teaching and learning not only refers to a formal education context, but also to general teaching and learning that happens in our daily lives.

The second layer of the model shows the fit of e-social astuteness, which is primarily build upon e-astuteness. This layer of the adoption model portrays the importance of the socio-economic context in driving e-astuteness and e-social astuteness adoption. The second layer takes into account the importance of social interactions among people, organisations and countries.

Lastly, the outer layer of this model shows the interdependencies with the relevant policies and frameworks such as ICT Integrated strategy, NDP Vision 2030, iNeSI and NeSPA.

2.6 Perceptions hindering full e-skills adoption

Student's perceptions are always useful when looking into adopting effective teaching and learning methods. Depending on what questions are asked, students can be an important source of information on efforts to improve teaching and learning (Ferguson, 2010; Bill & Melinda Gates Foundation, 2012). This is the reason why this research looks at IS student's perceptions in helping to identify the ideal adoption approaches to e-astuteness and e-social astuteness.

As discussed earlier, it is important to note that currently there is a lack of supporting knowledge on the perceived validity of these concepts. However, there is enough evidence that suggests that these concepts' main focus is on the use of ICT skills for both individual and social benefits.

Nchunge, Sakwa and Mwangi, (2012) claimed that the way in which user's perceive ICT has a massive influence on the level of technology adoption. Peansupap and Walker (2006) identify uncertainty and complexity of technology as the main cause of the lack of confidence in the users' perceived value and effectiveness of the ICT application, and further identify that this perceived risk exposure is capable of triggering user resistance. However, in an article quoted by Tan (2010), within an organisational context, the way in which the organisation perceives the need for and adopts new technologies is influenced by its technological, organisational and environmental contexts.

Hashim (2008) claims that in order for ICTs to produce any outcome, they first need to be adopted effectively, and this adoption requires a person to have basic ICT skills. Evidently, Peansupap and Walker (2006) identify that a lack of general computer skill can act as a limitation to the use of an ICT application, which can lead to a user developing a negative ICT use perception. Despite the proven need for a society to adopt ICTs, '…*the effective adoption of several ICT technologies requires a substantial investment of resources"* (Sahadev and Islam, 2005). Moreover, Antlova (2009) points out that, the factors that mostly prevents individuals' acceptance of ICT are knowledge and skills regarding information technologies.

Some of the challenges hindering ICT adoption in developing countries are highlighted by Manuere, Gwangwaya & Gutu (2012) as weak ICT strategies, excessive reliance on foreign technology and ongoing weaknesses in ICT implementation. To conclude, in an article quoted by Nchunge, Sakwa and Mwangi (2012) the user's perceptions regarding technology is influenced by the perceived usefulness and ease-of-use, which then influences their attitude towards adopting that technology.

2.7 The benefits associated with adopting e-astuteness and e-social astuteness

The research findings in this chapter underpin the concept that e-astuteness and e-social astuteness enables individuals to take much better advantage of ICT benefits. In an article by Mitrovic *et al.* (2013), the benefits of using e-astuteness and e-social astuteness are identified as similar to the benefits that digital competencies and skills have on communities, individuals and society. These benefits are identified as: social benefits (socially and culturally integrating communities), health benefits, economic benefits, civic benefits, cultural benefits and societal benefits (improving educational experience and value, setting up and sustaining business and developing 'self-driven' lifelong learning). However, these benefits are not confirmed by empirical studies.

2.8 Conclusion

Although this chapter leads to the proposition of a model for e-astuteness and e-social astuteness adoption, the discussion was merely theoretical. The next step in this research was to design the empirical research and select the research methodology, which is discussed in the next chapters.

3 CHAPTER 3: RESEARCH DESIGN AND METHODOLOGY

3.1 Introduction

The objective of this chapter is to show all of the major parts of this research project, including the methodology and sampling criteria and how these work together to address the main research questions.

The term *methodology* refers to the approach that is used to seek answers to a problem, but in social sciences it refers to the way in which research is conducted (Taylor, Bogdan & DeVault, 2015). It relates to a method or combination of methods that were used to carry out the research. The purpose of this research is to understand the perceptions of Information Systems students regarding e-astuteness and e-social astuteness. Seidman (2013) eludes that the best way for a researcher to investigate a process or an organisation is through the experiences of individuals that form part of the organisation/process. In this chapter the author describes the three main research approaches, namely; qualitative, quantitative as well as mixed-method approach. The author then discusses the methods, designs and the philosophy stance relating to the approach that is used on this research.

In short, this section outlines how the study was performed. It attempts to answer the following questions:

1. How was the data collected;
2. How was the collected data processed;
3. How was the collected data analyzed?

3.2 Research Design

Similar to a research process identified by Mackenzie and Knipe (2006) the following reflects the process steps that were taken to conduct this research:

1. Identify the paradigm suitable for the research;
2. Identify the research approach;
3. Conduct Literature review;

4. Choose data collection methods;
5. Data Collection and analysis;
6. Write up findings and conclusion.

3.3 Research Methods

Three main types of research approaches are widely recognized in literature (Creswell, 2009 and 2013; Dörnyei, 2007; Johnson and Christensen 2008; Brannen, 2005; and Pluye, Gagnon, Griffiths, & Johnson-Lafleur, 2009). Creswell (2009) defines these methods in detail below.

1. *Qualitative* - This research approach is used when exploring meaning that people bring to a social problem. Furthermore, Al-Busaidi, (2008) states that qualitative research methods are suitable when looking for meaning on people's perceptions because they put emphasis on experiences. Hence for this study a qualitative research approach is more suitable.
2. *Quantitative* - This approach is used for testing theories and examining relationships between variables, and analyzing those using statistical procedures. Hence most researchers distinguish between qualitative and quantitative research based on the types of research strategies used in the research (e.g., quantitative experiments or qualitative case studies).

   However, the main differences between qualitative and quantitative research is explained in terms of using words for qualitative and numbers for quantitative, and also by using closed-ended questions for (quantitative hypothesis) and open-ended questions in (qualitative interview questions) (Creswell, 2009).

3. *Mixed Methods* - This approach is basically an integration of the two approaches mentioned above and would entail collecting both quantitative and qualitative data.

Creswell further highlights that the main two components of a research *approach* is 1) the *philosophical* assumption and 2) the distinct *methods* or procedures, thus using a framework to explain the interaction of these three components.

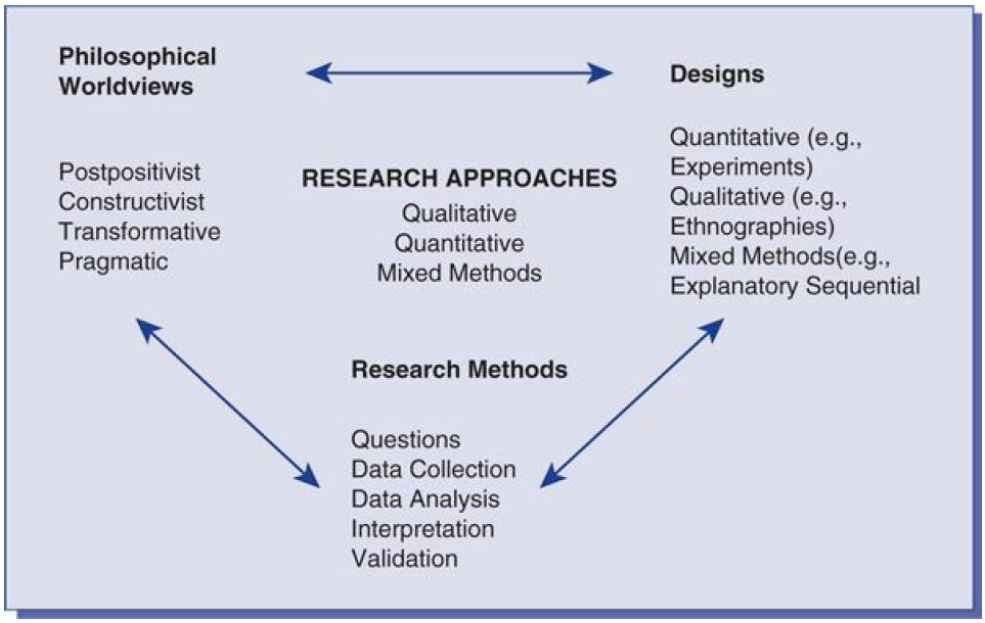

Figure 3: A framework for Research – The interconnection of Worldviews, Design and Research Methods

Source: Creswell (2009:5)

This thesis also makes use of the components as suggested by Creswell (2009). In the following section the author discusses the philosophical position taken for this research.

3.3.1 Philosophical Perspective

Myers (1997) outlined that all research (whether quantitative or qualitative) is based on some primary philosophical assumptions regarding what a 'valid' research is founded upon and which research methods are suitable. Furthermore, Creswell (2009) suggests that "*in planning a study, the researcher needs to think through the philosophical worldview assumptions that they bring to the study, the research design as well as the specific methods that translate the approach into practice.*"

When one speaks of philosophical perspective in research, often two words jump out. The first word is *epistemology* - which looks at how one acquires knowledge and the other word is *ontology* - which focuses on how one views reality. Krauss (2005) defines epistemology as the philosophy of knowledge and is ultimately related to *ontology* and *methodology*. To support his statement, Creswell (2009) uses the term *worldview* which he explains as a basic set of beliefs that guide action. The author

further acknowledges that other researches have called these *paradigms, epistemologies and ontologies or broadly conceived research methods.* The author identifies four types of *worldviews* namely; *Postpositivist, Constructivism, Transformative and Pragmatist (*Mackenzie and Knipe, 2006).

Worldviews as explained by Mackenzie and Knipe (2006)

Postpositivist (and positivist) paradigm

In an article quoted by the authors, *positivism,* which is sometimes referred to as "scientific method" or 'science research' is based on the rationalistic, empiricist philosophy that originated with Aristotle and other authors.

To support this statement, Creswell (2009) identifies that this *worldview* is sometimes referred to as *scientific method*, or doing *science research*. But this *worldview* is also called *positivist/postpositivist* research, *empirical science*, and *postpositivism*. According to an article quoted by Mackenzie and Knipe (2006) positivism was replaced by *postpositivism* after World War II.

Furthermore, according to Creswell (2009) in the scientific method, *postpositivist* begins with theory- collecting data that can either support or refutes the theory, and then finally makes necessary revisions and conducts additional tests. To support this statement, Mackenzie and Knipe (2006) also highlight that *positivists* and *postpositivist* research is most commonly aligned with quantitative methods of data collection and analysis.

Interpretivist/constructivist paradigm

According to Creswell (2009) *Social constructivists* lies on the belief that individuals seek to understand the world in which they live and work. Furthermore, the author highlights that the goal of the research is to rely as much as possible on the participants' view of the situation being studied. In addition, Mackenzie and Knipe (2006) quote that constructivists do not generally begin with a theory (as with postpositivists) rather they "generate or inductively develop a theory or pattern of

meanings" throughout the research process. Lastly, the author states that a constructivist researcher will most likely rely and make use of qualitative data collection methods and analysis or a combination of both qualitative and quantitative methods (mixed methods).

Transformative paradigm

In an article quoted by Mackenzie and Knipe (2006) *transformative paradigm* arose during the 1980s and 1990s partially due to dissatisfaction with the existing and dominant research paradigms. According to the authors, similarly to *Interpretivist/constructivists paradigms, transformative* researchers may utilize qualitative and quantitative data collection and analysis methods.

Below, Creswell (2009) summarizes views by Mertens, which detail key features of the transformative *worldview* or paradigm:

- It places central importance on the study of lives and experiences of diverse groups that have traditionally been marginalized. Of special interest for these diverse groups is how their lives have been constrained by oppressors and the strategies that they use to resist, challenge, and subvert these constraints.
- In studying these diverse groups, the research focuses on inequities based on gender, ethnicity, disability, sexual orientation, and socioeconomic class that result in asymmetric power relationships.
- The research in the transformative worldview links political and social action to these inequities.
- Transformative research uses a program theory of beliefs about how a program works and why the problems of oppression, domination, and power relationships exist.

Pragmatic paradigm

As quoted by Creswell (2009) *Pragmatism* derives from the work of Peirce, James, Mead, and Dewey. Furthermore, Mackenzie and Knipe (2006) identify that *pragmatist* researchers focus on the 'what' and 'how' of the research problem.

Furthermore, the authors highlight that while *pragmatism* is seen as the paradigm that provides the framework for mixed-methods research approach; some authors who use mixed-method approaches align themselves with t*ransformative* paradigm. Creswell (2009) states that even though there can be many views and forms relating to this paradigm, the worldview arise from actions, situations, and consequences rather than prior conditions – unlike in a *postpositivism paradigm.* As such, instead of focusing on methods, these researchers stress the research problem and use all methods and tactics available to understand the problem.

Table 3 shows the paradigms, methods and tools as summarized by Mackenzie and Knipe (2006)

Paradigm	Methods (primarily)	Data collection tools (examples)
Positivist/ Postpositivist	Quantitative. "Although qualitative methods can be used within this paradigm, quantitative methods tend to be predominant (Mertens, 2005, p. 12)	Experiments Quasi-experiments Tests Scales
Interpretivist/ Constructivist	Qualitative methods predominate although quantitative methods may also be utilised.	Interviews Observations Document reviews Visual data analysis
Transformative	Qualitative methods with quantitative and mixed methods. *Contextual and historical factors described, especially as they relate to oppression* (Mertens, 2005, p. 9)	Diverse ranges of tools - particular need to avoid discrimination. Eg: sexism, racism, and homophobia.

Pragmatic	Qualitative and/or quantitative methods may be employed. Methods are matched to the specific questions and purpose of the research.	May include tools from both positivist and interpretivist paradigms. Eg Interviews, observations and testing and experiments.

Table 3: A summary of paradigms, methods and tools

3.3.2 Methodology

Given the three types of approaches mentioned above, Creswell (2009) notes that the factors that affect what *worldview* the researcher chooses from is determined by the researcher's experience, the research question being answered as well as the audiences to whom the report is intended.

A Creswell (2009) notes that if a concept or phenomenon needs to be explored and/or understood - however there is little known about that concept, then it qualifies a qualitative approach to be used. Because this study hopes to study student's perceptions relating to the un-popular concepts of e-astuteness and e-social astuteness, from a philosophical perspective, it is identified that this research belongs to a qualitative research approach.

This is justified by the understanding that a qualitative research approach is suitable when looking for meaning on people's perceptions. It is further noted that a qualitative approach is more suitable for the *Interpretivist worldview*. Though, other worldviews identified earlier on the research such as *Transformative and Pragmatic* may utilize qualitative data collection and analysis methods.

This research relies on the students' perceptions in order to identify what they reveal about the ideal adoption model for e-astuteness and e-social astuteness. This is similar to the goal of the *Interpretivist* research which relies as much as *possible on the participants' view of the situation being studied* (Creswell, 2009)." This study takes an Interpretivist *worldview* that is qualitative in nature.

However, Myers (1997) notes that just as there are philosophical perspectives that can inform qualitative research, there are also several research methods. The next section looks at these methods.

3.3.3 Inquiry Strategies

According to Creswell (2009), the researcher does not only select qualitative, quantitative and mixed method approaches, these need to also follow different methods – as a result the inquirer also decides on a type of study within these three choices. According to Creswell, *research designs* also known or referred to as *strategies of inquiry*, are in essence types of inquiry within qualitative, quantitative, and mixed methods approaches that provide direction for techniques in a research design. In support of his views, Myers (1997) defines the research methods as *strategy of inquiry* which moves from a philosophical perspective to research design and how the data will be collected. The research methods which will be discussed in this study are action research, case study, ethnography as well as grounded theory.

1. **Action research** - Myers (1997) acknowledges that even though there are many definitions of action research, there is one reference that is mostly cited in literature which states that "*Action research aims to contribute both to the practical concerns of people in an immediate problematic situation and to the goals of social science by joint collaboration within a mutually acceptable ethical framework."*

2. **Case Study** - According to Johnston (2010) case studies tend to be narrow, focused investigations that are explanatory, exploratory or descriptive in nature (Yin, 1984). However, case study methods can be either positivist, interpretive, or critical, it solely depends on the philosophical assumptions of the researcher (Myers, 1997)

3. **Ethnography** – According to Johnston (2010) an ethnographic study is the type of research where the researcher is more interested to learn about the culture of

society, and thus directly participating in the research. In support of this, in an article quote by Myers (1997) Ethnographers spend most of their time focusing on the lives of the people they study. Myers also outline that this method has become more widely used in the study of information systems in organisations, from the development of information systems to

4. **Grounded Theory** – this method seeks to develop theory that is based on data that is systematically gathered and analyzed. Furthermore, grounded theory suggests that the process of data collection and analysis should be a continuous one (Myers, 1997).

3.3.4 Selected Methodology

In Tellis (1997) words, case studies are intended to bring out the details from the perspective of the participant. The author distinguishes between: *exploratory* cases as sometimes considered an introduction to social research; *an explanatory case* study to be used when one is conducting causal investigations and *descriptive* cases as the one that require descriptive theory to be established prior to commencing with a project. One of the drivers for selecting a case study method was because of the reasons by Yin (2003) that describe at what point one should choose a case study, which state that 1) when the focus of the study is to answer “how” and “why” questions and 2) when you cannot manipulate the behaviour of those involved in the study. This is in line with this study research questions and neither does the study seeks to manipulate the behaviour of the participants.

Baxter and Jack (2008) suggests that once the researcher has determined that the research question is best answered by using a qualitative case study, they also need to consider what *type* of case study will be conducted. For this research, the case study is *descriptive* in nature.

3.4 Data Collection

Yin (1994) mentions six different sources for collecting evidence in case study research as 1) archival records; 2) documentation; 3) interviews; 4) direct observation; 5) participant observation; and 6) physical artifacts. Tellis (1997) identifies interviews as one of the most important sources of case study information. Various research papers identify three main types of qualitative interviews transcripts namely; structured, semi structured, as well as in depth interviews (Britten, 1995; DiCicco-Bloom & Crabtree, 2006; Gill *et al.,* 2008; Hove & Anda, 2005). These are discussed in detail below.

Britten (1995) describes the 3 main types of qualitative interviews as follows:

1. **Structured** - The structure of these interviews consist of questions that are usually fixed, with limited response from the interviewee and questions asked in a standard manner. Furthermore *Gill et al.* (2008) describes structured interviews as "verbally administered questionnaires" with no opportunity for follow up questions that need to be expanded on.

2. **Semi-structured** - interviews consist of open-ended questions with flexibility for the interviewee and interviewer to diverge in their answers and questions alike. Gill *et al*. (2008) explains this diverging helps to monitor an idea or response in more detail. Furthermore, many studies utilize semi-structured interviews as the questions used in this particular kind of interviews consist of a mixture of open-ended questions designed to gather explicit information but also unexpected types of information Seaman (1999). Moreover, Semi-structured interviews are usually the only data source for a qualitative research (DiCicco-Bloom and Crabtree; 2006).

3. **In depth interviews** – According to Britten, in depth interviews are less structured than the structured and semi-structured types, and may cover only a single or two issues which are covered in much more detail. Further questions

that can be asked to the interviewee would depend on prior answers that the interviewee has given. In an article quoted by Legard, Keegan and Ward (2003) in-depth interviews are defined as similar to a 'conversations' with a purpose.

Given the views expressed above, for the purpose of this study, semi-structured interview were used to gather evidence. It is understood that this type of research interviews is widely used in Information Systems research (Myers and Newman, 2007). This became the obvious preferred method, firstly because of how little is known about the concepts and secondly the complexity of the topic. Interviews are a method of data collection in which the interviewer asks questions from the interviewee (Polit and Hungler, 1991). This can be done in either one of the two ways, either as face-to-face interviews or via telephone interviews.

Choosing this method has helped guide the questions that were asked and also allow the researcher to probe for more information and clarification. The typical questions that were used for this study included questions such as "what do you understand about e-astuteness and e-social astuteness?" how do you think these concepts can be adopted?"

3.4.1 Sampling

When it comes to the sample size of qualitative research, there are many varying suggestions and recommendations; with no one 'ideal' recommended sample size. It is solely upon the researcher to determine what sample size will be sufficient to answer the research questions, and this will be to a greater extent influenced by the size of study. In addition to this, author Sandelowski (1995) believes that a sample in qualitative research is relative, neither small nor large per se. In support of his statement, Britten (1995) also states that a sample size is not determined by standard, in his terms "hard and fast rules". But rather by other factors such as the deepness and duration of the interview and by whatever the interviewer sees as feasible.

Contrary to his belief, Marshall (1996) argues that a sample size in a qualitative research tends to be small. Moreover, in an article quoted by Green and Mason

(2010), it state that for most experienced researchers, little that is 'new' comes out of texts after one has interviewed 20 or so people". While writing the literature review of the guidelines in qualitative research, authors Guest, Bunce & Johnson (2006) discover a few studies which explain how one can determine sample size in qualitative research. Below is the analysis of these studies:

1. Bernard (2000:178) through his observations state that the most ethnographic studies are based on thirty-sixty interviews

2. Alternatively, Bertaux (1981) identifies a sample of fifteen as the smallest acceptable sample size when it comes to qualitative research.

3. Author, Creswell's (1998), believes that a sample size will differ for phenomenological studies and grounded theory studies. The author suggests a samples size of between five and twenty-five interviews for a phenomenological study and twenty-thirty for a grounded theory study.

4. According to the author, Kuzel (1992:41) he bases his recommendations on sample diversity and research objectives. The author recommends six to eight for a comparable sample and twelve to twenty data sources "when looking for disconfirming evidence".

In light of these reviews, a sample of 20 participants was used to conduct this research study, and one-on-one interviews were used to collect the data. According to Sturges and Hanrahan (2004), researchers conducting qualitative research and utilizing semi-structured or in-depth interviews rely on face-to-face interviewing.

In an article quoted by Meho (2006) it states that face-to-face interviews tend to provide better-off data than telephone interviews and e-mail interviews. It was anticipated that 20 participants are enough to provide necessary information in order answer the research questions. The author also acknowledges that having more participants does not necessarily mean quality of the data collected. This was evident from the interviews from the 10th participant or so, the participants seemed to provide somewhat similar responses to the interview questions. Mason (2010) states that when it comes to qualitative research there comes a point, which he refers to a

point of diminishing returns where the data collected does not necessary add more value or lead to more information.

Though the study had a limitation in that it was focused on only one population, Forman, Creswell, Damschroder, Kowalski, and Krein (2008) wrote that in qualitative studies participants are not selected based on convenience and unlike in quantitative studies, they are also not selected randomly. But rather, they are selected for in-depth study as they are considered "information-rich," and are considered useful sources for answering the research questions. This is the reason why Information Systems students were selected as the study population. There was a perception that these students would be at a better position to understand and answer the interview questions. Though other similar studies in the past

3.4.2 Instrument Design: Interviews

The basic principles used in structuring the research questions were based on a research article by Leech (2002) titled "Asking questions: techniques for semi structured interviews" One these basic principles suggested was how to make the participant feel at ease during the interview. The article suggests that this can be achieved by explaining the research project again during the interview - with the first time being in the recruitment email sent. The article further suggests that the researcher need to describe to the participant the type of questions that they will be asked without "tipping your hand as to the hypothesis". The author also highlights that this is the point where you can reassure participants that their answers would be confidential.

Taking the above into consideration, the opening questions to the interviews in this research were structured in such a way that would ease participants into answering the rest of the questions.

The questions were divided into three sections (refer to *Appendix A* for the questions); *Section 1* was made up of general questions that were relatively familiar, thus hoping that they would be easier for the interviewee to understand and ease them into the interview. *Section 2* focused more on answering the main research questions as well as the sub-research questions of the study. It attempted to get the

student's understanding about the concepts as well as whether or not they thought these concepts could be adopted. *Section 3* of the questionnaire was focused on the plausibility of the proposed adoption model that was introduced in *Chapter 2* of this research. In *Chapter 4* the sections of the interview are further broken down into themes and subthemes. The first section enabled the researcher context that was useful in the later stage of the interview. The second section consisted of more specific and complex questions, and because at this phase students are comfortable enough to engage, they were more confident in sharing their opinions.

3.4.3 The Interview Process

The activities explained below were followed during the interviews process:

Before the interview – The researcher scheduled a meeting with most participants. However, some participants were approached around the University campus and were asked on the spot if they liked to participate. Emails about the study were sent to all Information Systems students and the interviews were scheduled following a positive response of interest to participate. The email sent to students read a brief research study description for the students to familiarize themselves about the research topic. The email also contained the consent form and a permission letter from the University to conduct the research.

Britten (1995) explains that the location of the interview is vital as it will affect the results, thus suggesting that participants should be preferably interviewed at home. Interviews for this study were conducted in and around campus. Some took place at the student center while most were conducted at the Economics and Management Science (EMS) Faculty where the Information Systems Department is situated.

Conducting the Interviews – Similarly to Leech (2002) principles, listed below, McNamara identifies eight principles that should be applied in preparation for the interview, (as cited by Tumme III, 2010). The principles were also applied to this study.

- Choose a setting with little distraction;
- explain the purpose of the interview;

- address terms of confidentiality;
- explain the format of the interview;
- indicate how long the interview usually takes;
- tell the interviewee how to get in touch with you later if they want to;
- ask the interviewee if they have any questions before you both get started with the interview;
- Do not count on your memory to recall their answers

Prior to conducting the interviews, the researcher first explained the purpose of the study and then handed out the consent form. Each participant was informed about the time it would take to conduct the interview and given assurance about confidentiality. A general consent form informing the participants of their rights were handed over to the participants, which also informed them that they could withdraw from the study at any point if they wished. An accompanying audio recording consent was also handed to the participants, so that they were aware that the interview was being recorded. All interviews were audio recorded for simplicity and accuracy.

The interviewer maintained an informal and humorous tone to allow the participants to be at ease. At all costs the interviewer refrained from arguing the answers that were given by the interviewee, even when probing; the questions that were used were not to reach a predetermined outcome but rather to gather more opinions. Just like in any interview, other participants came across as shy, even though the researcher could not establish whether it was because of lack of interest in the topic or if they simply were uncomfortable to talk. Whatever the reason was, the following strategies were used to cope with the participants:

- The tone of the interviewer changed, became more loose and informal to accommodate these participants and get them more relaxed and at ease. The interviewer adjusted the tone from serious to more humorous and fun, vice versa depending on the participants' facial expressions

- The participants were told of the importance of their views for the purpose of this research and that without their responses, this study could not be completed.

After the Interview - After the interviews were conducted, the researcher set a week aside to transcribe and summaries all the interviews. It took 1 ½ hours per interview to transcribe. When the data was summarized, it was grouped into sections, also identified here as themes and sub-themes in order to make it easier to report on the findings. These themes are defined in detail further in the following chapter (Chapter 4).

3.5 Data Analysis

According to Creswell (2009) the researcher who engages in qualitative methods support a way of looking at research that honours an inductive style, focuses on individual meaning, and the importance of interpreting the complexity of a situation. In support of this Patton, (1990) state that the inductive way is commonly used in qualitative research, often with research themes generated out of the data collected, while on the other hand, the deductive approach is more useful in quantitative research where data is used to support a hypothesis. Since the most common way to gather data in qualitative research is through interviews and focus groups, it is not uncommon for researchers to utilize a data analysis approach that involves the construction of themes.

According to Elo and Kyngäs (2008), the inductive approach is useful when there is no prior knowledge of the topic, whereas the deductive approached is used more to test previous knowledge and the purpose of a study. The inductive reasoning style has been utilised in this research. Though there are many analysis approaches such as the qualitative content analysis and the Framework method, each of these with its own advantages and disadvantages, the thematic analysis was used for the study and themes and subthemes developed for organizing the data. According to Gale, Heath, Cameron, Rashid, & Redwood (2013) in practice most researchers opt for a combination of approaches but this is especially if they need to to discover other unexpected aspects of the participants' experience.

One of the main advantages for using a thematic approach is its flexibility. This approach can be used to answer different types of research questions and is also suitable for research questions on people's perceptions or views. The themes are identified per interview conducted from the twenty participants that took part in the research study - these are further discussed in the next chapter. The next chapter also shows the conceptual research categories and subcategories that emerged from the data gathered are summarised.

4 CHAPTER 4: RESEARCH FINDINGS INTERPRETATION AND ANALYSIS

4.1 Introduction

In the Literature Review section of this thesis, the researcher established a theoretical framework concluded by existing literature in order to answer the following research question: 1) what is e-astuteness and e-social astuteness and the skills associated with these concepts, and 2) What are the best approaches to adopting e-astuteness and e-social astuteness. As an addition to knowledge gathered in *Chapter 2*, this chapter will briefly deliberate on the participants that took part in this study. As well as present the research findings obtained from the interviews that were conducted, by organizing the interview questions sections into themes and subthemes. The interview questions were designed to gather perceptions of participants relating to the concepts of e-astuteness and e-social astuteness and their adoption, as well as the perceived skills believed to be linked to these concepts.

4.2 Description of Participants and Interview

As mentioned earlier on this research, the data was gathered for this research by means of interviews. A total number of 20 participants were asked to participate as outlined in the previous chapter. The interviews took on average 20 minutes to conduct. The longest time taken to answer the interview questions was just over 29 minutes and the shortest time being 10 minutes 52 seconds (see Table 2). It was essential that the research questions for this study were structured in order to reach the objectives of the study and thus guide the participants with questions essential to answer the study research questions. The list of questions that were asked from the participants is shown in *Appendix A*. The following shows the information that was collected from the participants.

No	Date	Time	Duration	Gender	Level of Study
01	02/06/2016	15h21	20:51min	M	2nd Year
02	02/06/2016	15h48	17:55min	F	1st Year
03	03/06/2016	16h10	21:53min	M	2nd Year
04	04/06/2016	08h55	10:52min	F	3rd Year

Table 4: Participants Information

See full list in Appendix D

It took a week to conduct all the interviews for this study with all the interviews taking place during the day time. Participants preferred to meet during the day time as most of them were not staying on the University grounds (campus) and had to travel home afterwards. Although not displayed in the attached table, only thirteen out of the twenty interviews (65%) were conducted at the Economic and Management Sciences faculty where the Information Systems department is situated. The rest of the interview took place in and around campus.

The participants that took part in this research were Information Systems students who could have fallen in any of the following groups:

- Full time/Part time B Com Information Systems
- Full Time/Part time B com General
- Studying towards any other degree with Information Systems selected as module or major

Mentioned above are also the possible streams that participants can take in order to graduate with an Information Systems Majors Degree. Without any significance and/or influence to the findings of the study, the participants were of different ethnicity and ages and were also requested to supply information regarding their gender, level of study as well as the modules that the students were currently registered for. Although this was not asked, three participants out of the twenty that took part in the interviews expressed that they were part time participants. *Table 5*

depicts the general biographical information that was asked from participants during the interviews.

Gender	Female	8
	Male	12
	Total	**20**
Level of Study	First Year	6
	Second Year	8
	Third Year	4
	Honours	2
	Total	**20**
Modules	First year module	8
	Second year module	10
	Honours module	2
	Total	**20**

Table 5: Biographical information of Participants

Out of the twenty individuals that took part in the interviews, twelve (60%) of them were males whilst the remaining eight (40%) were females. There was a representation of Information Systems participants from different levels of study except at Masters and PHD level. It was important to interview Information Systems students from all levels of study so that the research had a holistic view of the entire Information Systems population. The participants that took part in the study were distributed as per the following: Six (30%) of the participants were in their first year of study, Eight (40%) were in their second year, four (20%) were doing their third year and the final two (10%) were studying towards their Honours in Information Systems. At the time of the interviews, only eight (40%) of the participants were registered for the first year Information Systems module, ten (50%) of them were registered for the second year module and the remaining two (10%) were registered for the Honours modules. Even though gathered from participants, the information had no significance and did not play any role in the research study.

4.3 Method of Data analysis

Even though the theoretical framework that was established in *Chapter 2* helped organize the information and structure the interviews. The interview questions that were used to conduct the study were broken down into three sections. For consistency and logic of this chapter: these sections are conveyed in terms of *themes* that possess common point of reference, and further divided into *subthemes* (the actual interview questions).

The themes and subthemes are general descriptive elements that are used to organizes and group the data according to questions that have similar ideas. This research has further broken down the subthemes into *categories* and *subcategories* hence presenting the following flow; *Section* > *Theme*> *Subtheme* > *Category*> *Subcategory*. According to Jones, Turunen, & Snelgrove, (2016), category describes a theme and refers to the descriptive level of text and clearly displays the participant's explanations. The following table depicts how the interview questions were grouped along with their accompanying themes and sub-themes.

Sections	Theme	Sub-theme: Interview questions
1 & 2: Student's understanding of e-skills as well as e-astuteness and e-social astuteness	i. Understanding of e-skills	**1.** What do you understand about e-skills or ICT skills? **2.** Do you think having e-skills is important? Why is it so? **3.** Would you say you possess e-skills of your own, what are they? **4.** When would you say you acquired your e-skills and do you use these in your everyday life? **5.** As an Information Systems student, what are the typical e-skills that you think are needed at this day and age? **6.** As a current Information Systems

		student, what do you think about the current teaching and learning environment at the university? Is the university doing enough to teach about e-skills and encourage the use of e-skills?
	ii. Understanding of e-astuteness and e-social astuteness	**7.** What do you understand about e-astuteness and e-social astuteness? **8.** What is your willingness to learn more about the concepts of e-astuteness and e-social astuteness
	iii. General perceptions relating to e-astuteness and e-social astuteness	**9.** e-Skills that participants think can be linked to e-astuteness and e-social astuteness **10.** Is the university engaging participants by utilizing e-astute/innovative ways to teaching and learning?
	iv. Perceptions relating to the adoption of e-astuteness and e-social astuteness	**11.** Possibility for the university to adopt the concepts of e-astuteness and e-social astuteness; do you think these concepts can be adopted? **12.** In what way can the concepts be adopted?
3: Plausibility of proposed model of e-astuteness and e-social astuteness	v. Perceptions relating to usefulness of the model	**13.** Perceptions relating to the importance of collaboration in driving e-astuteness and e-social astuteness **14.** In what way do participants think the model of e-astuteness and e-

		social astuteness can be improved?

Table 6: Research Findings Themes and Sub-themes

4.4 Presentation and Discussion of Findings

The i*nductive* reasoning method was utilized to summaries the findings section of this study and is based on categories and subcategories that emerged from the themes. The interviews were conducted in order to refine the theoretical framework established in *Chapter 2* of this research (*inductive reasoning*), instead of using a theoretical framework and then using interviews to prove a hypothesis (*deductive reasoning*). The theoretical framework that was established helped structure the findings but was not in any way imposed on the data that was gathered as well as the categories and subcategories that emerged. However this does not mean that the author did not generate a theoretical framework before starting the data collection, it simply means that the author continuously formulates new theoretical framework as obtained from the data gathered. The following themes arose from sections 1 to 3 of the interview:

i. Understanding of e-skills
ii. Understanding of e-astuteness and e-social astuteness
iii. General Perceptions relating to e-astuteness and e-social astuteness
iv. Perceptions relating to the adoption of e-astuteness and e-social astuteness at the university
v. Perceptions relating to the usefulness of the adoption model of e-astuteness and e-social astuteness

4.4.1 Section 1 and 2– Students understanding of e-skills, e-astuteness and e-social astuteness.

To introduce concepts such as e-astuteness and e-social astuteness or even suggest ways in which these concepts can be adopted, it is imperative to first seek the extent of understanding of the more basic concepts such as e-skills or ICT skills. The intention of section 1 of the questionnaire was not necessarily to answer a

specific research question but rather to refine the conceptual framework established in Chapter 2. Also, it is there to help establish the effort that will be required to introduce and teach about e-astuteness and e-social astuteness by determining if there is basic understanding of less complex concepts. Section two however is there to answer some of the research questions.

4.4.1.1 Student's understanding of e-skills

E-astuteness and e-social astuteness involves possessing e-skills and being able to use these e-skills for the benefit of not only yourself but the others as well. The purpose of this theme was to obtain student's basic opinions of how they perceive e-skills and how important they think e-skills are. In order to establish this, the following questions were asked (Refer to Appendix A):

1. What do you understand about e-skills?

It was evident from the majority of participant's responses that there was a vague and general lack of understanding when it came to the concepts of e-skills. The student's responses were grouped according to the following categories and subcategories.

Category	Subcategories
No understanding at all	- The participants were not sure what ICT stood for - However, participants feel that they should know what ICT skills and e-skills mean.
Some understanding	- Skills associated with being able to use computers, electronics and social media - Skills associated with being able to use Information Systems - Skills associated with being able to use technology

Table 7: Summary of responses to Section 4.4.1.1 question 1

The group of participants that had no understanding about the concepts of e-skills/ICT Skills had not previously heard of the concepts and asked the author to elaborate what the concept of e-skills was.

The responses that the researcher got were:

> *P4: "Can you just elaborate on the abbreviations"*
> *P5: "I don't think I know what e-skills is, I know what e-commerce is."*
> *P13: "Honestly I haven't heard of it yet, so I don't have much knowledge about it."*

It was evident from most of the participants that took part in the study that there was a lack of understanding on what the concept of e-skills was. Among some of the participants, a few felt compelled to gain an understanding of what ICT skills or e-skills were, especially since most were enrolled for an Information Systems module. As mentioned earlier on, all but five of the participants that took part in the interviews were going to take up information systems as their major. One of the responses that express this is shown below:

> *P14: "Am I supposed to know what e-skills is? What does ICT stand for"*

The participants that either had no knowledge at all of e-skills or some understanding but were not entirely sure were able to grasp the concept after the researcher explained to them. One of the participants made an attempt to answer the question based on their understanding that the "e" in e-skills stood for electronic.

The group of participants that had some sort of understanding about what e-skills was all expressed slightly different views from one another. But all of their views were centered on the idea that e-skills were the skills associated with knowing how to use technology. Some of those views expressed are quoted below:

> *P3: "What I do understand about e-skills sort of having my skills and applying them in a sense of using the modern technology…"*
>
> *P12: "When you talk about e-skills you talk about the internet, anything to do with computers. It's basically involves computers …"*

P15: "I understand that it has to do mostly about technology and everything with regards to technology and how you apply, how you use technology in daily activities"

However what was discovered is that the student's understanding about using technology seemed to be limited to the use of computers and phones and being able to do the basics in a computer such as browsing the Internet, using Microsoft Office. Participants could not give a detailed description of what e-skills are and the types of e-skills. The following quotes bring the author to this conclusion:

P16: "e-skills would be the ability for a person to use basic functions of a computer, let's say Ms Word, PowerPoint etc. etc. So it would be the ability to use a computer and its functions."

P20: "Ok! Just on the surface knows about the computer, online information and how to navigate it and how to work around it. Basically it's knowing your way around the computer and the internet of course because it's all electronic stuff."

What was common among the student's responses when asked this question was a notion of the importance of ICT in our everyday lives.

2. Do you think having e-skills is important? Why is it so?

This interview question was asked in order to find out whether or not participants felt it was important to have e-skills. In light of the responses to the first question, participant's lack of understanding of e-skills generally didn't influence the responses to this question. In the previous question participants displayed a vague understanding of what e-skills were. However, after the concepts were explained to the students, all answered "Yes" to this question. Even though the reasons varied, most highlighted that having e-skills would help improve one's life. The participants expressed that the rate at which the world is changing and the influence of

technological devices required people to keep up with the trends. The categories and subcategories below group the participant's responses:

Category	Subcategories
The need to keep up with technological trends	- Having e-skills allows one to move forward with the rest of the world - Having e-skills allows a person to keep up with technological trends
Use technology to make life easier	- University require you to have e-skills - Having e-skills makes living life a lot easier - E-skills allows ease of communication with others - E-skills enable people to improve their lives
Use technology to stay competitive and find jobs	- Workplace requires a person to be technological advance - People with technological competencies are more competitive in workplace - People with technological competencies can find a job/work a lot more easier than people without - One needs e-skills to partake in online business transactions

Table 8: Summary of responses to section 4.4.1.1 question 2

Participants felt that as the world is changing in terms of technological advancement, people needed to keep up with the changes in order to become competitive and improve their lives. This advancement to the participants means being able to use computers and their functions in either work or personal lives and being able to communicate with others via social media.

Furthermore, the world has slowly moved from traditional ways of communicating and doing business to the more digital advanced platforms. According to the student's opinions, having e-skills enables you to keep up with what is happening

around the world in terms of the ways people interact, whether it is for business or person interactions. The following quotes can illustrate this finding

> *P15: "It is very important because technology is ever changing and as the world evolves technology is becoming one of the used devices or one of the most used tools, so having e-skills would equip you with skills and knowledge to be able to move forward and help you keep up with the changes."*

> *P17: "…technology has advanced more, in our today's world so we have to be informed with the standard of technology that is being upgraded daily."*

> *P20: "… At this day and age everything is done on PCs and most things are done now on the computer, communication, phones all connecting to laptops. I think it is important that everybody has e-skills sometime because that's where digital inclusion comes in because some people might not have these skills. So I'd say it's very important."*

When a student enrolls at university, it is expected of them to learn the basic skills such as researching the web, typing, creating PowerPoint presentations etc., mainly having the basic e-literacy skills. Participants believe that these skills are vital to successfully complete their modules, because at any one point one might be required to utilize them. Also for some of the Information Systems modules, interactive learning is encouraged by use of online document sharing platforms such as Google Docs. This notion is expressed by participants in the following quotes:

> *P13: "… if you are able to use these devices you would be at an advantage in terms of internet that will help you with your research and whatever you doing in coursework. I believe it is truly important for an individual to have these skills."*

> *P10:" …it gives you real time information although if you're in different countries you can still work together, collaborate like Google docs. So it makes life easier."*

Communication among peers at university and among people in general is important especially since humans are social beings. The ways in which people communicate has become more real time and visual. People no longer rely on older methods such as sending letters by post and faxing, even though these methods are still widely used. Social media applications have made it more possible to communicate with each other in a ways that were not achievable in the past. People can now communicate effectively without necessarily having to spend that much time when comparing to the time it takes to write and send a letter by post. The views expressed by the students are shown below:

> *P16: "… everything now that we are using is based on ICT technology, so now if you do not have those e-skills it becomes difficult for that particular person to communicate with other people or to do certain things, let's look at banks for example. Because banks are going electronic for example, they are doing the electronic way so if you do not have those e-skills it becomes quiet difficult for you to…."*
>
> *P18: "…As you know the world is now based on technology. Smart phones, computers it makes things easier now communicating with people around the world"*
>
> *P8: "… mainly we live in a very technological world, everything is always changing. Now there is no time to be writing things down every day. So it's very important to get in with the times"*

It is evident from countries that are more advanced in their technological adoption, that the benefits of e-skills cannot be matched. In a paper quoted by Bacon and MacKinnon (2010) the European Union (EU) has targeted to be the world's knowledge economy. The EU hopes to do this by developing highly skilled and literate workforce that would be able to utilize the benefits of the latest technologies. It is without question that possessing the right e-skills can make lives a lot easier by transforming the way people do things. This is expressed by participants in the following quotes:

P7: " …More things are computerized these days, and the aim of technology I think is simply our lives or assist us so you are going to rob yourself of a lot of things that can make your life a lot easier if you don't have e-skills."

P14:" … we always use technology these days and it's so relevant and makes life easier.''

The standard job search and application process nowadays requires a person to: a) access a job application portal; b) type out a CV and/or cover letter and send it (via email, fax or post) or any other preferred method; and c) If shortlisted, go through competency assessments, which in some cases may include a digital competency assessment. There is an expectation from the job market for applicants to be e-literate in order to be considered for a job. Depending on the nature of the job, one might also be required to possess certain advanced ICT Practitioner and User skills. A quote from one of the student participant outlines this:

P1: "… The world is changing and the knowledge that is required by the working environment. It's important the one must have a knowledgeable mind about information systems because in the working environment we'll be using computers and we must start, it is crucial for us as participants as well as perspective employers to know about computers and stuff. That's why e-skills are important."

In a white paper by Kolding and Kroa (2007), which is based on a survey of over 600 employers in 10 European countries who were asked to rate the information and communication technology (ICT) skills of their staff and the future ICT competence needs of their sector. The following summarizes the results:

- The amount of money that was invested in the past 10 years has made the European workforce acquire basic ICT skills.
- ICT skills are undoubtedly a very crucial ticket to the job market
- The future ICT skills go beyond having the basic e-skills
- I CT skills of the workforce are crucial for organizations

- There are barriers such as lack of time, innovation and money that hinder employees to acquire critical ICT skills
- The need and importance of ICT is needed mostly in traditional industries such as agriculture and transportation

Similar responses to the ones expressed in the white paper (above) were gathered from participants when asked if ICT skills were important. Participants believed that the workplace requires one to be technological advanced in order to be more competitive and to find a job. This is illustrated by the following quotes:

> *P3:"…first of all it's inevitable that technology is what we use because even in the work places you just cannot avoid that you have to use technology is some way or the other. "*
>
> *P5: "… At this day and age technology is viable and you need technology to do everything, your CV the working environment. Since the world is changing technology is changing as well so you have to keep up with the latest."*
>
> *P6: "… in today's job market everyone is using computers everything is moving towards a digital platform so I'd say it's very important to have e-skills."*
>
> *P12: "if you don't have the necessary skills you probably would be left behind and it might reduce your chance of finding work someday."*
>
> *P2: "…usually nowadays most business transactions happen through online transactions, which mean you need e-skills."*

3. Would you say you possess e-skills of your own, what are they?

In *Chapter 2* of this thesis, the author identified 4 different types of e-skills, namely *(1) ICT practitioner skills, (2) ICT user skills, (3) e-business skills and (4) e-literacy.* Mitrovic *et al*. (2012) defines these types according to the following:

- *ICT Practitioner skills* - The capabilities required for researching, developing, designing, managing, producing, consulting, marketing, selling, integrating, installing, administrating, maintaining and servicing IT systems.
- *ICT User skills* - Skills required by individuals for effective application of ICT systems
- *E-business skills* - The capabilities needed to exploit opportunities provided by ICT. To explore new capabilities of new ways of conducting business and organisational processes.
- *E-literacy* - The capabilities needed to socially appropriate ICT for local development

All the participants that were interviewed possessed some sort of e-skills. However, the majority of the participants only noted of having the basic e-skills (e-literacy) leaving a handful that were confident that that they had acquired ICT Practitioner and ICT User skills. The e-skills were grouped according to the following categories and subcategories.

Category	**Subcategories**
ICT Practitioner skills	- Coding
ICT User skills	- Using e-learning Platforms such as Ikamva - Understanding and using computer Applications - Microsoft Certified Development course (MCDP)
e-literacy	- Microsoft Office (PowerPoint, Word, Excel) - Typing - Research (Surfing the internet) - Computer Literacy

Table 9: Summary of responses to section 4.4.1.1 question 3

Only one of the participants (P13) expressed procession of ICT Practitioner skills which in this case was coding. The student selected coding as part of the course modules they were registered for. The University utilises an online platform known as

Ikamva, and most of the participants had learnt to use Ikamva as it was incorporated in their teaching and learning. Ikamva is an interactive e-Learning platform that is used to share information between the students and the lectures. One of the participants expressed the following views when asked if they had any e-skills:

> *P10: "Ikamva, it's very useful as we upload documents and we get slides there. It can be used as a backup also."*

One participant identified enrolling in Microsoft Certified Development course (MCDP) as an attempt to improve their e-skills: However, the participant did not finish the course. The following is what they had to say.

> *P6: "…MCDP is Microsoft Certified Developmental course, I didn't finish but I do have a couple of qualifications and certificates as well. I mean I grew up around computers: my mom has worked for a computer company, many years ago. So I grew up around computers, I enjoy finding out what makes them tick. I mean I strip them apart and put them back together"*

Another participant identified personal computer application knowledge (both theoretical and practical). The participant gained this knowledge through a computer applications technology subject at high school.

> *P15:"I offered Computer Applications Technology on school as a subject so I do… there was a theoretical part and a practical, I was Microsoft word, Database and Presentations briefly and then websites.*

According to Mitrovic (2010) ICT user skills allows individuals to apply systems in support of their own work, which in most cases is not related to ICT. This can involve using common software tools and other specialized tools. One of the participants (P9) shared that they had participated in various courses that were paid for by the employer. The courses were intended to help employees use applications and

programs required in the working environment. The following quotes reflect their responses:

> *P9 "… the basic of the courses which I attended under various concepts, with my employer they have put us onto various eLearning skills as well, they have actually introduced it to us as well where you go through assessments, the assess you as well electronically. All with that is that there is certain programs that we can utilize in the work environment as well, presentations and such."*

Being enrolled at the university means participants spend a majority of their time on their laptops and/or computers, either conducting research for an assignment, typing out a report or drafting a simple PowerPoint presentation for that next big presentation. This explained why the majority of participants possess the basic e-literacy skills. The following quotes express their view:

> *P8: "… Well I'm a very fast typer."*
>
> *P11: "Surfing the web, that's my web, email skills and understanding how the web works and understanding where it comes from."*
>
> *P12: "… I know how to work a computer, I know how to type. Basic things"*
>
> *P13: "… I am able to use certain things gadgets, such as my phone laptops and computers basically."*
>
> *P13: "Google, I type my documents, I create PowerPoint presentations."*
>
> *P16: "… I can use the basic function of a computer, I can use PowerPoint and I can also create PowerPoint slides and also do some calculations on Excel."*
>
> *P18:" I would say like writing an email, Microsoft, Typing downloading."*
>
> *P19: "I think I do because I am like capable of using a computer, a pc and everything and I can do word, so basically I think so."*

Also, the pressure to constantly sign up on social media websites in order to communicate with peers has meant that the participants regularly visit the internet. This is what one of the participants had to say:

> *P1: "… I am able to operate a computer: I am involved in social networks. So I don't need someone else to educate me or act on my behalf on social networks. So I do have those skills, I can operate it by myself."*

However, one of the participants identified that e-skills were acquired through parental exposure and expressed this as:

> *P5: "… Phone, computer, internet because my brother is an IT engineer so he gave me the basics."*

One of the participants, who was a full time employee identified skills acquisition in their work environment. Below is the participant's view:

> *P7: "… As far as there computers are involved I've got a lot of skills that I gained over the years from my work environment, they were former."*

4. When would you say you acquired your e-skills and do you use these in your everyday life?

Because e-astuteness and e-social astuteness entail incorporating e-skills in one's daily life, the intention for this question was to figure out how and the participants acquired their e-skills and whether or not they were continuously incorporating them in their daily lives. The responses were grouped according to the following

Category	Subcategories
Learnt e-skills during early childhood stages: ICT exposure	- Primary school had computers and for learners there were computer classes - Having interest and being fascinated by computers meant I was constantly exposed

Learnt and acquired e-skills in High School or at University	- Being exposed to computers at university helped me improve on my e-skills - Assignments that involved typing, doing research and creating PowerPoint presentations helped me refine my e-skills - Taking computer applications technology in high school helped me refine my skills
Acquiring e-skills is a continuous process	- You cannot acquire e-skills all at once - Modules that participants are enrolled in help participants refine and learn new e-skills - Being active on social media sites enables participants to refine on their e-skills.

Table 10: Summary of responses to section 4.4.1.1 question 4

How and when the participants first acquired their e-skills is different from one participant to the next, which was determined by their exposure to ICTs. However it is generally known that participants at the university will acquire e-skills as part of their learning process and will continue acquiring more as they transition into the working environment. But for one participant acquiring e-skills was through being inquisitive by trial and error. The following quote expresses their views:

> *P12: "Well I started off by just teaching myself, I'm inquisitive so I just go through a computer looking for things, how does this functions, how does that function work. I think that doing Information Systems has helped with that more."*

Also, participants feel that acquiring e-skills is not a once off process, but rather that it's a gradual continual process influenced by exposure. An obvious conclusion from this research suggests that teaching and learning needs not to be in a formal setting such as at universities, high school etc. but it can also happen in an informal setting

such as in our homes, doing our daily tasks. The following are quotes from these participants:

> *P9: "acquiring my e-skills is a continuous process, any new concept like now for example we are doing a new communications concept called Epic…"*
>
> *P11: "I think it's a gradual process, because you can't learn all of these things at once because all of them are too complex. So it was gradual."*
>
> *P16: "… I am always now on Facebook, sending emails, communicating with people via a computer."*

When asked if they used e-skills in their everyday lives, almost all the participants expressed that they use e-skills regularly. This is what participants had to say:

> *P13: "Yes, A lot because I used to have computer classes after school. I believe I use them every time because here at varsity you get to type assignments."*
>
> *P15: "… I use it every day because I use Microsoft to draw up your CV, databases not as much as every day because you don't do that. I make presentations daily because for academic purposes you need to use it."*
>
> *P19: "Yes I do use it in my everyday life, everyday life when I do assignments and when I type something and I acquired them when I was here on campus and also in high school."*

Below are some of the quotes from participants explaining how and when some of their e-skills were acquired:

> *P16: "I acquired them when I got here on campus, actually before I got here I had never ever touched a computer before, so when I got here I was exposed to the computer."*

P17:" I would say when I went to Grade 10 and I did CAT as a subject, CAT is Computer Applications Technology, so that's where my interest actually developed and."

P18: "In high School, we were taught about computers, like computer skill."

P6:" I think when I acquired them I mean was when I was very young, so I obviously developed an interest in them and I wanted to expand on them and I do use it every day. All my assignments are done on the laptop and when I type notes it's on a laptop, I don't sit with a pen and paper."

P8: "In Primary school because at home we've always had a computer, those computers that were like big. I forgot what you call them."

P14:" I think I learnt probably the first time was in Primary School."

5. What are the typical e-skills that you think are needed at this day and age?

This question was intended to test the participants' perceptions on what e-skills they think are needed for the twenty first century. It was expected that the responses provided would help this thesis establish the starting point on the amount of work required in order to educate people about the possible e-skills associated with e-astuteness and e-social astuteness. The responses were grouped according to the following categories and subcategories.

Category	**Subcategories**
ICT Practitioner skills	- Databases
ICT User skills	- Theoretical and practical knowledge of Information Systems
e-literacy	- Microsoft Office (PowerPoint, Word, Excel) - Typing - Research (Surfing the internet) - Computer Literacy

A combination of e-skills	- One needs to be technological wise

Table 11: Summary of responses to section 4.4.1.1 question 5

The majority of participants' perceptions of the e-skills that are needed for this day and age are basic e-literacy skills. This finding of course is notwithstanding the fact that the students could have possibly not been able to identify any other e-skills as they are not aware of them, other than the ones they are exposed to. This finding therefore does not entirely suggest that the participants believe that it is only basic e-literacy skills that are required for this day and age.

The following quotes represent the e-skills that students were able to identify:

P6: "Typical e-skills would be, Microsoft word where we need to type out ne documents, we need to be able to send emails because people don't write letters anymore as that's how we communicate these days. Mobile technology is also advancing very quickly and people need to understand that and be able to use it."

P8:"Basic understanding of how to use a computer, PowerPoint, Word, Excel, even though I do not know how to use it. Because when you get to the workplace you will use those e-skills."

P11: "Computer literacy, understanding how the web works I think day to basics and social media and networking basically."

P16: "The basic skills to use the internet, I would say for example the basic skills of doing searches on Google, being able to send emails and also being able to check emails. And also possibly social networking because that's where people network nowadays."

P19: "You need to be able to use a computer, I think that is a necessity and you also need to be able to type assignments, and use programs like Mandalay. You also need to be able to draw diagrams on the computer."

P20: "Basically knowing how to communicate."

Two participants in their response identified that one needs to possess a number of e-skills at this day and age by stating, "*One needs to be technology wise and know e-skills that you never heard of*". Even though they were not able to identify these e-skills, this is what they had to say:

> *P10: "You need to be like technology wise because that's where we moving, that's where we move towards, it's important to know all the new (inaudible)"*
>
> *P4: "I think you must know what it's about basically, like Information Systems is skills on the other level of skills that you've never heard about."*

While on the other hand, another participant identified that one needs practical as well as theoretical knowledge of databases. Another participant noted the importance of having information systems theoretical as well as practical knowledge. The following represents their quotes:

> *P15: "… Background knowledge in databases because it allows you to understand the theoretical part and a background in Microsoft Word, the basic Word."*
>
> *P13: "… you need to know how systems operate and use it to your advantage."*

6. What do you think about the current teaching and learning environment at the university? Is the university doing enough to teach about e-skills and encourage the use of e-skills?

This interview question was intended to help this thesis make sense of the effort that is required from a teaching and learning point of view at a university level in order to breed e-astute learners. The student's perceptions were instrumental in helping to determine how much still has to be improved as far as teaching and learning is concerned. Participant's responses to this question are categorised according to the following:

Category	Subcategories
The university does not teach about e-skills and encourages the use of e-skills	- The university only encourages e-skills if you're enrolled for an Information Systems modules - There is a lot of theory taught and less practical work
The University teaches about e-skills and encourages the use of e-skills	- Information Systems help expand on the knowledge of students - DAL (Digital Academic Literacy) modules help to improve e-skills of students. - The university makes use of eLearning platforms such as iKamva - Utilising digital platforms to submit assignments such as Turnit in helps students improve on their e-skills.
The university is doing something but it's not enough, they can do more	- The university is doing something even though more practical work is still required to be incorporated in the modules. - Utilising e-astute and innovative ways of teaching is dependent on the lecture. - DAL module is only taught at first year level - You are in a better position to improving e-skills if you are enrolled for an Information Systems course than if you are registered for any other course

Table 12: Summary of responses to section 4.4.1.1 question 6

Participant's responses to this question were based on their observation on campus and what they perceived (according to their understanding of e-skills) as e-astute or innovative ways of teaching and learning. The majority of the participants felt that the university was engaging students in e-astute ways of teaching and learning. The

common responses made reference to the university utilizing the *Ikamva e-learning website,* and the fact that first year students are taught *DAL*. DAL, also known as the Digital Academic Literacy Programme is *aimed at equipping novice users (in this case 1st, 2nd and even Honours Level) students at the university with basic digital academic literacy skills, and other technical skills (*Siebrits, Stoltenkamp and Mokwele: 2015). According to participants, the fact that the pass rate for DAL is at 70% means that the university is serious about developing and improving the student's e-skills. The quote below reflects the student's views.

> *P2: "I think it is doing enough, because there is another course called DAL, which you need and you'll be equipped with computer skills and you'll need of 70% to pass it. In that way we leaners are forced to learn about computers."*
>
> *P14: "I do think so because they have a DAL module that helps you with PowerPoint, Excel and Word."*
>
> *P16: "Yah! I think so, let's look at EMS for examples all first year students are being taught digital academic literacy (DAL), showing that the university is indeed quiet serious about teaching people about e-skills and making sure that each and every EMS graduate is able to use a computer and that they are equipped with e-skills going to the world of work."*
>
> *P18: "Yes I think so, they also have a program called DAL it teaches you these thing. It teaches you, like Microsoft word, PowerPoint, they teach you how to write email. Not typing."*

Moreover, some students mentioned again iKamva, Turnit-in as well as well as Information Systems modules as an attempt by the university to improve student's e-skills level. The following is what they had to say:

> *P6: "… I mean in the Information Systems module I've learnt quite a bit. I mean there are things that I thought I knew but it's obviously expanded on my knowledge base already. I mean with the use of Ikamva, people are communicating on a digital platform is something that is being promoted all*

the time and we are always being reminded of it to go check Ikamva and everything. The university is definitely promoting the use of e-skills."

P10: "Definitely, because like I mean most of the time like with Information Systems you are forced to use things like TurnItin. Before that we didn't know about iKamva, it was all new like being a student now I need to make use of those things."

Oppositely, there were three participants that felt that the university is not doing enough to promote and enhance e-skills. Two participants suggested that one is at a better chance of improving their e-skills if they are enrolled for an Information Systems class then if they were enrolled for any other module. The Participants believe that being taught about the latest technologies and utilizing interactive digital platform to learn is only relevant and is only utilised in Information Systems classes. The following quotes depict what they had to say:

P4: "I think if you don't have an IS class I don't they're doing enough but if you are enrolled for IS then you do get those skills."

P20: "I'm in the middle. The thing is for us doing Information Systems we have to be taught what e-skills is and all of that, we have to be taught how to interact with the computer, but for someone that does law for example, I don't ever hear them talk about the computer and that kind of thing."

However in contrary to these participant's views another reflected that the Information Systems module that they were registered for did not extend on the practical work by taking the students to training workshops and training programs. Whilst another participant elaborated that it would help to see the systems they were being taught about. These participants also elaborated that the only practical knowledge they had was in theory. The following quote highlights these views:

P11:"I do not think it does enough because our practical work is just in the module that we are doing but it doesn't extend, they aren't like training

workshops or training programs for students to learn and improve on our e-skill."

P12: "Yes, first year. We don't have any practical, we doing Management, IFS. No we not at that level yet, but it would be better to see the system and see how it works."

Furthermore, there were some participants that had mixed views when asked this question. They felt that even though the university was doing something it could possibly do more in order to increase e-skills levels of students. One of the common reasons was that most of the modules offered at the university were more theory based and a lot more practical work would help. The view expressed by one participant was that some modules such as Data modeling require practical exposure rather than theory. Also, one participant mentioned that some lectures were innovative in the way they taught more than others, thus, innovative approaches only being a matter of individual teaching style rather than a university wide way of teaching. The quotes below express these views:

P3: "They do encourage the use of e-skills but I feel like that if they could put more practical work than theoretical work than most people would acquire e-skills. Because according to my understanding, for one to be sort of an expert to some e-skills of some sort. One needs to do the work continuously, like practically rather than theoretically. For example the modules like data modelling and such, for those modules you need more of the practical work and those analysis and stuff for that data."

P5: "It depends on the lecture, at the university as a whole. I mean they can even have screens in the building to explain to students the concepts. I mean the lecture can go over it over and over all the time or even videos."

4.4.1.2 Students understanding of e-astuteness and e-social astuteness

The purpose to this section was to find out how much participants knew about the concepts in order to help establish how the concepts could be adopted. The following questions were asked:

1. What do you understand about e-astuteness and e-social astuteness?

The participant's responses are grouped according to the following categories and subcategories:

Category	Subcategories
Participants possess no understanding about e-astuteness and e-social astuteness	- Participants had never heard of the concepts of e-astuteness and e-social astuteness and thus have no understanding

Table 13: Summary of responses to section 4.4.1.2 question 1

Participants did not have any understanding of what these concepts meant because they had never heard of them. This sort of response was expected to an extent because these concepts are relatively new. This was also anticipated because of the earlier responses to the previous question about e-skills (where there were even more participants that did not know what these concepts were). However, this is not to be confused to a response that was anticipated prior to conducting the study. There were a handful of participants that made an attempt to define the concepts. One of these participants willingly admitted to having done research on the concepts when the recruitment email was sent out to students. But prior to this, the participant had not heard of the concepts of e-astuteness and e-social astuteness. The following quotes the participants definitions of the concepts:

> *P1: "My basic understanding is that e-astuteness are skills that any individual can have of Information Systems,"*
>
> *P2: "… I think they have something to do with computer because there is an "e"."*

P6: "… I would presume it would be about your knowledge of technology."

P15: "I researched the word astuteness you sent the email and it said that you have this mental ability to understand and comprehend concepts, I would be assuming that it has to do with electronics and how you understand electronic concepts."

It seemed that the participants definition of e-astuteness and e-social astuteness was more accurate to the definition of e-skills that was given in section one of the interview.

2. What is your willingness to learn more about the concepts of e-astuteness and e-social astuteness?

Before asking participants about their willingness to learn about the concepts of e-astuteness and e-social astuteness a 'dictionary' definition of these concepts was given. An explanation about these concepts followed the definition and participants were made aware of what could be accomplished by being astute and e-social astute. The general definition of these concepts (as shown below) was given and explained to the students:

E-astuteness *is the capacity to continuously appropriate the technology into personal work, education, business, social and family contexts for both personal and collective benefit. e-astuteness is defined as a knowledgeable capacity, based on personal and interpersonal skills, that involves; understanding people and situations and building alignment and alliances.*

E-social astuteness *: is defined as the use of ICT and e-skills for more astute ways of people interacting with others, which include; social interactions, a level of awareness and understanding of diverse social situations and the various alternatives open to them for response.*

The following categories and subcategories emerged from the participant's responses:

Category	Subcategories
Willingness to learn about the concepts of e-astuteness and e-social astuteness	- Learning about these concepts will enable me to improve the lives of my family and community members. - Learning about e-astuteness and e-social astuteness means you can be able to incorporate it in your work life - Learning about the concepts will allow for companies to be able to use technology to their full capacity - E-astuteness and e-social astuteness are concepts that I have already adopted and incorporated in my daily life.
Willing to learn about e-astuteness and e-social astuteness but there are some reservations	- e-social astuteness will make people rely more on technology for communication and less on face to face interactions - It is not something that interest me

Table 14: Summary of responses to section 4.4.1.2 question 2

When asked this question, participants overwhelmingly expressed that they were willing to learn about e-astuteness and e-social astuteness. The ability to fully appropriating the benefits that can be achieved by using ICTs and being able to communicate with people around the world are just some of the things that make participants willing. The participants are aware of the influences of technology in our everyday lives, thus the idea to learn how to fully appropriate the technology and make it part of your daily life was interesting. Furthermore, the participants are aware

of the benefits that can be linked to these concepts, which is what also influences their willingness. The following is what they had to say:

> *P1: "Definitely I am willing to learn more, because as I said before e-astuteness and e-social astuteness are very important in our daily lives because there is certain benefits that we can get from them, so that's the reason why I'm willing to learn more about them."*
>
> *P17: "I think I would want to learn about them, so that maybe in future I can interact more interactively with ICT."*
>
> *P19: "I'm actually interested, I am willing to learn more about them because as you said we use it for our everyday lives and we use it for our personal benefits."*
> *P18: "Yes, I'd say it would improve my life; you get to know what's going on around the world. You get things like tweeter where you get to know what's going on."*

The thought that understanding and adopting these concepts can influence the idea of work prospect seemed to influence the willingness

P4: "… I mean you can use it in your work life and that's interesting."

Some participants felt that being e-astute and e-socially astute would help improve their communities and family lives. They believed that if they are e-astute or e-social astute they would refer that knowledge to their communities so that they too can understand the importance of technology in improving their lives. Since the university was previously identified as underprivileged under the apartheid government. Consequently a large number of participants are a representative of the so called "underprivileged" social class. Most of these students still come from communities where acquiring e-skills is farfetched as there are more pressing issues such as poverty and unemployment facing these communities. The following is what the participants had to say:

P5: "I would actually learn about them because I would like to help my community, there is people who is underprivileged in my community who is not even aware of the computer and can't do jobs for their parents because most of the time you find out that they did not know."

P15:" I'm very willing, since as you mentioned it's a bigger picture and it impacts everyone in the world. I think that it would be very interesting first and foremost to learn about and very beneficial towards me and my family."

However, one participant expressed that they had already adopted e-astuteness and e-social astuteness in their lives. But acknowledged that having a deep understanding of what they entailed would enhance his skills. The following represents this view:

P6: "If I look at the definition it's something that I do already apply in my daily life. Understanding the concepts will definitely be able to sharpen my skills by making use of technology in those ways and in a work environment eventually once I do graduate it's definitely going to put me at an advantage"

On the other end of the scale, there were a few participants that were sceptical about the willingness to learn about concepts. One of the participants expressed that there was constant pressure from society to constantly be up to date with the latest technological trends; this includes having the latest cell phones, having the coolest mobile applications and being active on certain social media platform. Hence it is not easy to make the decision. The participant didn't elaborate on their reasons other than saying the concepts didn't interest them - The following is what was said:

P8: "Willing but not so much, I don't want to really say no because these days especially with the smart phones they are changing and so on, a friend of mine her phone can tell her heart rate and like how many walks you've taken as a guideline to improve your health."

Another participant expressed that they were willing to learn and adopt e-astuteness but not e-social astuteness. The participant felt that that being e-social astute will ultimately mean that all social interactions happen through technological platforms. However, according to this research, this is far from the truth as e-social astuteness suggests using technology to help build social interaction where otherwise face to face is not possible. Moreover, some technological platforms such as Skype still embody the idea around face to face interactions. E-Social astuteness will not take away from the existing way in which people have social interactions, but will rather help improve where interactions were previously hard to achieve. The following views were expressed by the participant:

> *P11:" e-social astuteness, I think I wouldn't want to learn about it because you know that saying about the more we have connection to the internet the less we are connected to people… I am willing to learn about e-astuteness bbecause I think with e-skills and ICT skills it doesn't only make your life easier, like with your daily proceedings, but it can improve those people's lives that are actually in more dire situations."*

4.4.1.3 Student's general perceptions relating to e-astuteness and e-social astuteness

The purpose to this theme was to find out what e-skills the participants thought could be linked to e-astuteness and e-social astuteness. Also this section attempted to find out whether or not students believe the current teaching and learning process at the university incorporates innovative approaches and enhances participant's e-skills. The following questions were asked:

1. **What are the e-skills that can be linked to e-astuteness and social astuteness?**

The literature review identified possible e-skills that can be linked to the concepts of e-astuteness and e-social astuteness. To refine and/or add on what was suggested in chapter two, the students were asked this question .The participant's responses are grouped according to the following categories and subcategories:

Category	Subcategories
ICT Practitioner skills	- Ability to manipulate technological devices and understand the way they work
ICT User skills	- Using certain software - Using certain Information Systems
e-literacy skills	- Typing - Using Social networking site - Communicating via email - Microsoft Word - Microsoft PowerPoint - Microsoft Excel - Surfing the internet

Table 15: Summary of responses to section 4.4.1.3 question 1

When answering this question, participants struggled to identify e-skills as most did not have even a basic understanding of what e-skills are. Therefore it is important to note that when answering this question, participants only identified the e-skills that they were aware of, so the responses do not entirely suggest that these are the only e-skills that participants think could be linked to e-astuteness and e-social astuteness. The following summarizes a few of the participant's responses:

> *P13: "I believe they are able to use and manipulate the devices in a way and they are able to understand not just what it seems but what is behind, like what it makes that device."*
>
> *P7: "e-astuteness comes in when I can teach myself new computer skills and software skills."*
>
> *P10: "e-social would maybe be like Facebook and you can socialise, interacting. E-astuteness as you said its work related so maybe like different Information Systems, different platforms and learn how to use them."*

P6: "well like using a computer, being able to communicate via email, Facebook, Twitter, Instagram all these Social Media apps."

P16: "Maybe basic skills like how to sue Ms Office and its features like PowerPoint and Excel."

A few participants did not know what e-skills could be linked to the concepts:

P12: "I have no idea"

P4: "Not quite sure, there is such a lot of e-skills. Well use of technology I guess."

2. Is the university already engaging students by utilizing e-astute/innovative ways to teaching and learning?

It is important to find out if the participants think that their current teaching and learning environment encourages innovation and thus whether or not it is enabling to build up e-astuteness and e-social astuteness levels. There were mixed views from participants when asked this question. The responses ranged from participants that believed that the university's teaching and learning approach made use of innovation to the one's that strongly suggested otherwise. Refer to the categories and subcategories that follow

Category	Subcategories
The university's teaching and learning approaches are innovative	- The university makes use of Ikamva - The university shares study material online and communicates with students via email - Some lectures bring Information Systems objects in class

The university does not utilise innovative approaches	- There isn't that much innovation in other modules - The Ikamva platform sometimes does not work as it should - The university is doing nothing more than any other higher education institution.
The university could do more	- Learning new e-skills for students is voluntarily and not a prerequisite as far as utilising the campus "computer lab" is concerned **NB**: The *computer lab* is a walk in lab that operates on a first come first serve basis where students can learn basic e-literacy skills such as typing and Microsoft Office competency.

Table 16: Summary of responses to section 4.4.1.3 question 2

Most of the participants that believed that the university incorporates innovation in the teaching and learning process made reference to initiatives that have been identified in previous questions which is Ikamva. Moreover, some participants strongly suggest that one will find innovative approaches being utilized more in Information Systems classes. Furthermore, one of the participants further suggested that in one of the Information Systems modules the lecture brings IS objects so that they can see how the systems work.

> *P16: "Yes! I think so, that's why we now have Ikamva, I think the University is trying to incorporate those innovative/e-astute ways, because now they also have the mobile App for Ikamva, that shows that the University is indeed serious about it."*

> *P1:" Yes, because they are programs which are provided by the institution which seek to involve students in more ways of developing their knowledge, specifically Information Systems."*

P13: "They bring like the real IS objects to class so that we can see how it works, they show us videos, slide shows..."

One participant suggested that when the university engages with students by means of email, this could be considered an innovative approach. While another participant referred to the fact that study material is shared online with students. The following is what they had to say:

P10: "I'd say it's improving, it's useful. For me it's useful because whenever I am at home they can still reach you, they can still communicate with you like on your Gmail account and they can still communicate."

P14: "Yes, it is kind of encouraging because they put the study material online and stuff like that."

Among the participants that believed either that the university was doing less than it should or nothing at all in terms of incorporating innovation in the teaching and learning process. The following is what they had to say:

P8: "Well teaching and learning for other modules there isn't any innovative ways, they're not using innovative ways… sometimes they upload stuff on Ikamva and sometimes it will be hard to access it because it won't open."

P19: "They don't use innovative ways because if you go to another university they're doing the same. There is nothing different here. It's not innovative because it's similar to everywhere else."

P20: "As to whether the school is doing enough, I think not really. Sure there are so initiatives where they say … there is e-teaching at Thintana Lab but it's not part of courses. So it's like an involuntarily thing, you have to go there if you want to go there. I think the university could do more in that regard."

4.4.1.4 Student's perceptions relating to the adoption of e-astuteness and e-social astuteness

This theme sets to identify what students think about the possibility for the university to adopt these concepts and how they think e-astuteness and e-social astuteness can be adopted. Therefore, the definition of these concepts will be revisited. The following research questions (subthemes) were asked.

1. **What is your opinion about the possibility for the university to adopt the concepts of e-astuteness and e-social astuteness? do you think it is possible at all?**

The general definition of adoption means to be adopted or the act of adopting. But in the context of this research adopting the concepts of e-astuteness and e-social astuteness simply means the following:

- Learning and understanding what the concepts of e-astuteness and e-social astuteness mean and entail
- Possessing the necessarily e-skills that can be linked to these concepts, and being able to integrate e-skills in one's everyday life for the benefit of not only yourself but also to improve the lives of others.
- Possessing and using e-skills for social interactions with other people and for socio economic benefit.

The following categories and subcategories emerged from the student's Reponses.

Category	**Subcategories**
It is very possible for the university to adopt these concepts	- The university should provide more computer lessons as part of the courses - The concepts can be adopted only if lectures go on courses - Lectures are very knowledgeable of the subject they are lecturing and are willing to help students.

The university has already adopted the concepts of e-astuteness and e-social astuteness	- There is already DAL implemented - The Ikamva mobile site is an example that the university has already adopted the concepts - Offering modules such as Information Systems are all an attempt for the university to get e-astute learners.

Table 17: Summary of responses to section 4.4.1.4 question 1

Participants feel that it is possible and it will be crucial for the university to adopt the concepts of e-astuteness and e-social astuteness. Participants also believe that because there is already a module/initiative such as DAL and Ikamva that promote e-skills as well as willing and experienced lecturers it is very likely for the university to introduce these concepts. However, one participant believes that the modules that are already offered by the university are an example that the university encourages the adoption of these concepts. The following expresses the participant's views:

P2: "… there is DAL, so it's not difficult to improve because it's not like they'll be starting from the ground. There is already something."

P7: "I think it's definitely possible and at a certain level I think the University has already started because what I mentioned about the Ikamva, they didn't give us any training on the Application…"

P18: "… They got these, DAL classes, so they already incorporated e-astuteness and e-social astuteness."

P15: "I would say because we have willing lectures, we have students such as yourself who are interested and care for the greater good of the community and students, so I would say that everyone working towards the common goal, I think that they would be able to introduce and develop these concepts."

P12: "I think they can be adopted because from my experience the lectures are very good, because when we come for consultation they actually know

what they talking about, so if they are that good they can only help us better if they have the resources."

P13: "Because currently there is Information Systems and students studying IS, so with these concepts it would be taking IS into a deeper level and giving more knowledge to students and more understanding why they do IS."

Moreover, some participants feel that even though it is possible to adopt these concepts, it might be a challenge to adopt them. As many things at a university might need to change. Some of the things that have been identified by participants is the suggestion that lectures should go on courses as well as underprivileged students at the university. The following views are expressed by the participants:

P6: "…. It may be a challenge first of all for students that don't have the internet first of all in their personal capacities."

P5: "yes they can be adopted, but then the lecturers have to go on a course to say listen here students learn differently. So I can either say by slides by visual by radios."

P16: "Yes they can be adopted, but I think it's going to be a struggle for students who are coming from deep rural areas, who have never even seen a computer when they come here, because even if you have done DAL there are still some functions of a computer that you can use…"

P20: "… It takes time, everything that's good takes time. It takes some convincing before something is bought into, so if it were to be adapted to the school you'd have to have very convincing proposal for it to be adopted."

2. In what way can the concepts be adopted?

The following categories and subcategories summaries what the participants think about how the concepts can be adopted.

Category	**Subcategories**
What the university	- Incorporating practical example and practical work

can do	in lectures - Teaching about e-astuteness and e-social astuteness and introducing the concepts as part of the NQF levels - Introduce new technological devices - Training and workshop programs - Introduce the concepts in tutorial - Taking lecturers to workshops for training - Introduce online tests
General things that can be done	- Opening social networks group
These concepts have already been adopted	- The university should do everything that it is doing now. - The university already has Ikamva and DAL

Table 18: Summary of responses to section 4.4.1.4 question 2

E-astuteness and e-social astuteness requires a combination for efforts, a shift from the traditional way of doing things – it involves people integrating technology and innovation in all that they do. Even though the ideas that have been suggested by the participants such as; having social media groups; getting new IT equipment that students can learn about and use; making learning more practical and introducing a module that speaks about e-astuteness and e-social astuteness; introducing the concepts via by playing videos; are all innovative approaches that are applicable at university level. These recommendations all speak to adopting innovation as part of the teaching and learning process. The teaching and learning that happens outside of the university in our everyday lives also needs to incorporate innovation - things such as access to computers as well as learning and utilizing different technologies in our daily dealings. However, this might prove to be a problem as not everyone will have access to technological devices.

Moreover, innovation has been incorporated in the suggested adoption model for e-astuteness and e-social astuteness as a result the participant's views are an

expansion of that. The following expresses the views that were gathered from participants:

P3:"… The way they can be introduced I would say if you put more of team work and practical work."

P9: "… they can be introduced as part of the curriculum, and also form part of the NQF."

P5:"… have the slides and videos of the concepts, the lectures can make videos and email it to the students, explaining maybe how it flows on cross flow diagrams. Because some individuals are visual learners and they learn with what they see."

P11: "… definitely with workshops and training programs and interactions between the lecture and students."

P12: "… lectures could have like short courses or afternoon courses for them to learn the systems, and within the tutorial groups they could help us (students) understand the concepts better."

P16: I think it would have to start in the first year, maybe DAL shouldn't be a semester course, maybe it should be a yearlong course where students are not only taught the basic functions of a computer, maybe in the first semester, and as they are progressing they may be taught much more difficult stuff.

P20:"… You can introduce the general topic in class but in tutorials have it done more in depth as some people pay less attention in class."

Other participants believe that the university had adopted e-astuteness and e-social astuteness.

What this theme reveals is that the adoption model should cater for the training requirements for the lecturers that are involved in teaching and learning process. Furthermore, the participant's perceptions also place emphasis on the adoption

model to cater or be aware of individual capabilities. Finally, the adoption model needs to speak to the continuous seamless approach to teaching and learning, meaning that teaching and learning that leads to e-astuteness and e-social astuteness need not to happen at university but should also continue in our homes, places of work and residences. This ultimately means addressing the issues of the socioeconomic imbalances first. The model is refined in the following section and possible recommendations on how South Africa can deal with the socioeconomic imbalances addressed.

4.4.2 Section 3 – Plausibility of the proposed model for e-astuteness and e-social astuteness.

4.4.2.1 Perceptions relating to the usefulness of the adoption model

An adoption model for e-astuteness and e-social astuteness was proposed in *Chapter 2* of this thesis. To test the applicability of this model, the model was shown and explained to participants and the following questions were asked:

1. **What is your opinion on the importance of collaboration in driving e-astuteness and e-social astuteness?**
2.

Category	Subcategories
It is very important to have collaboration to drive e-astuteness and e-social astuteness adoption	- Policies can enforce what needs to be done - Government can provide necessary funding - Government can provide the right infrastructure for effective adoption. - Collaboration can allow for the exchange of ideas

Table 19: Summary of responses to section 4.4.2.1 question 1

After the adoption model was shown and explained to participants, they felt that a collaborative approach between government as well as private/public organisations is important. The views are that collaboration can play a significant role in the buy in

from citizens through creating an enabling environment for the adoption of these concepts. Having government involved in promoting and driving e-astuteness and e-social astuteness can fast track the adoption of these concepts. It is without a doubt that for effective adoption of these concepts, there is a need to have access to ICTs. Most participants believe that the main function of government's involvement is to provide the necessary funding and or/infrastructure support for effective adoption, whether it is through establishing e-learning centres in underprivileged areas or furnishing public schools with PC's and/or iPads. The following expresses just some of the participant's views:

> *P6: "The importance of a collaborative policy, I think that there are different aspects to the importance of collaboration but the most important thing would be the financial aspect of it. I mean technology is very expensive and I believe it would be very costly as well to certain organisations and not many people would afford an internet connection for instance."*
>
> *P16: "I think it is important because now we have all these sectors to drive such initiative, because you need the government for example to install your broadband wires all over, you also need a few other sectors to, and other partners that are going to teach people the skills that are important in order to use computers and in order to implement such things."*
>
> *P19:" I think it's important to having policies and government institutions to support the adoption because it will accelerate teaching people about it because it will also mean that there are funds to do it."*

One participant expressed an opinion that a collaborative approach would mean that parties are able to bounce off ideas off each other as different views are needed to make this work. The following expresses the quote from the participant:

> *P13: "If there is collaboration this whole thing can be a success through e-skills, if we make as individuals it can never be a success. Sometimes different inputs are required to make this work."*

2. In what way/s can this model be improved? Please explain your answer?

Participants feel that the proposed adoption model is fine the way it is. The following categories and subcategories summarises the response:

Category	Subcategories
The model does not need improving?	- The model is fine the way it is but can be continuously reviewed and improved - The model covers everything but understanding individual capabilities is the most important

Table 20: Summary of responses to section 4.4.2.1 question 2

Majority of participants felt that the proposed adoption model was complete; however felt that if they were given enough time to review the model they could come up with some suggestions. Whilst some participants suggested that there is always room for improvement and that the model should be continuously refined. The following are the views expressed:

P1: No, to me it looks complete. If I had a time to go and reflect on it, I would come up with some ideas but in the meantime it looks marvellous.

P13: "Well I don't have that much knowledge of the model, but I believe as I can see it looks well well-planned and that it can be a success."

P20:"I believe that there is always room for improvement, maybe if the model was to be adopted and to be implemented, then maybe you'd see perhaps something else could come into here and there."

5 CHAPTER: 5 CONCLUSION AND RECOMMENDATIONS

5.1 Introduction

This section starts by restating the research motivation and methodology. It then continues to summarize the chapters of this thesis, followed by revisiting this study's research objectives. Lastly, implications of the findings and limitations of the study are stated followed by recommendations and the final conclusion.

5.2 Summary

What prodded this research was the idea that little is known about the concepts of e-astuteness and e-social astuteness and more understanding needed to be established in order to effectively introduce and adopt them (Mitrovic *et al*., 2013). This research study attempted to gain an understanding from students of how much is known about the concepts of e-astuteness and e-social astuteness. It was expected that the student's perceptions could formulate the best approach to adopting and introducing these concepts. The literature review highlighted leadership theories and their interdependence with e-astuteness and e-social astuteness. The literature review also proposed an adoption model for astuteness and e-social astuteness. However, the empirical investigation was conducted in order to add or improve the findings of the literature review.

A Qualitative case study research methodology was used to conduct this research study. Semi- structured interviews that were conducted as means of empirical data collection allowed the participants to elaborate on their responses. The sample was limited to 20 Information Systems students from a university in South Africa.

5.3 Revisiting Research Objectives

5.3.1 Research Objective 1

The first research objective was to explore Information Systems students' perceptions relating to the concepts of e-astuteness and e-social astuteness as well as the adoption of these concepts. Through the empirical investigation it was found that a majority of students have only a basic understanding of e-skills. Thus,

suggesting that participants, being future IS professionals, needed more knowledge regarding e-skills and should be made aware that e-skills go beyond possessing Microsoft Office skills and knowing how to search the web.

Another important finding from the empirical investigation was that students have a clear understanding of the importance of possessing e-skills. The apparent view expressed by the students is that having a distinct ICT skill gives one a competitive edge in the working environment, when compared to other people with the same education and expertise. Notwithstanding that the process of acquiring e-skills is continuous and is largely influenced by the willingness and exposure to ICT.

5.3.2 Research Objective 2

The second research objective was to explore the concepts of e-astuteness and e-social astuteness by identifying the facets of these concepts and the skills associated with them. Existing literature was reviewed in order to understand the concepts of e-astuteness and e-social astuteness. iNeSI (27th Edition) and NeSPA (2013) identify e-astuteness as "*The capacity to continuously appropriate the technology personal work, education, business, social and family contexts for both personal and collective benefit"* and e-social astuteness as the use of ICT and e-skills for astute ways of people interacting with each other. Three types of skills were identified to be linked with the concepts namely; ICT or e-skills, personal skills and interpersonal skills. This finding is similar to that of Mitrovic *et al*. (2013); Mitrovic *et al*. (2014) and iNeSI (Edition 16, July 2013). In addition, this research however also identified *leadership* as a critical skill.

The literature review revealed that e-astute and e-social astute individuals are situational leaders, thus underpinning the concepts to the Hersey and Blanchard situational leadership model II. This model is based on individual maturity levels and developmental levels and it was thus suggested that it is important to consider these for effective adoption of e-astuteness and e-social astuteness.

In addition to the literature review findings, the interviews conducted also revealed the types of skills (mostly *e-literacy* skills) that students perceived to be linked to e-astuteness and e-social astuteness. The majority of students did not have any

understanding of e-astuteness and e-social astuteness but almost all were willing to learn more about these concepts. However, when asked about skills that could be linked to these concepts, the majority of participant identified basic e-literacy skills such as typing, Microsoft excels, Surfing the internet - to name a few - as skills needed in order to be deemed e-astute or e-social astute. Furthermore, a few participants identified the need for *ICT practitioner* skills - those skills that permit people to understand, produce and use the new ICT's such as software applications, networks and computers.

It can be argued that the skills identified by participants are not necessarily all the skills that they believe could be linked to these concepts, but just the ones that they are most familiar with and are able to identify. Therefore, the author acknowledges that the skills identified are not a representation of the final list, but solely a suggestion of some of the skills required. Further research into the appropriate combination of skills is needed.

5.3.3 Research Objective 3

The third research objective was to explore ways by which the concepts of e-astuteness and e-social astuteness can be adopted in South Africa as well as in the teaching and learning environments at the university. In the literature review section of this thesis, a model for the adoption of e-astuteness and e-social astuteness was proposed. However, students' perceptions revealed new knowledge and the model is amended accordingly.

The interviews revealed that for effective e-astuteness and e-social astuteness adoption, training and workshop sessions for the teachers are needed. Additionally, new technological devices need to be introduced at universities as well as introducing these concepts as part of the NQF. The definition of e-astuteness and e-social astuteness clearly illuminates that in order to be deemed e-astute and e-socially astute one does not necessarily need formal education. However, the majority of participants strongly believed that from a higher education point of view, the teaching and learning environment at the university currently makes use of ICTs and/or innovative approaches for the benefits of students. Also, participants felt that the way in which the university engages with them is helping improve their e-skills. It

was recommended that the adoption model encompasses Prozesky's (2000) teaching and learning elements. These elements are explained in next section.

Furthermore, it was established that it is still vital to have a collaborative approach between public, private and governmental organisations. This collaboration would see government organisations drive ICT related initiatives, provide programs or support existing one's as well as investing in ICT infrastructure, with the support of private and public organisations.

5.3.4 Research Objective 4

The final objective of this study was to develop an adoption model for e-astuteness and e-social astuteness based on students' perceptions. The literature reviews lead to the proposition of an adoption model. However, due to a lack of understanding of the concepts, students were not able to identify ways by which the adoption model can be improved. But they did identify ways by which the concepts can be adopted, which particularly focused on improvements in the teaching and learning space. Summarised below are the students' views along with the literature review findings as well as Prozesky's views.

- Students identified that teaching and learning should shift from being theoretical base to more practical. Furthermore, the literature review identified that different people learn at different ways.
- Students feel that in order to successfully adopt these concepts, willing lecturers with the right training are required, as well as the right infrastructure in schools.
- There is a need for training and workshops to successfully introduce and adopt e-astuteness and e-social astuteness.
- Students acknowledge that lecturers are knowledgeable in the subject matter they are teaching and are always willing to assist students. However, the students also feel that the university should provide more computer lessons.

Some of the students' views expressed above as well as those similar to the proposed adoption model were found in a journal article about teaching and learning by Prozesky (2000). The article pinpoints effective teaching and learning elements. Although the article is dedicated to teaching and learning in 'Eye Health', the author of this thesis believes that the same elements are applicable to teaching and learning in general. This research adopts the author's elements in order to refine the proposed adoption model of e-astuteness and e-social astuteness.

The following summarizes Prozesky's views:

How different individuals see teaching and learning is based on our past experiences. Some individuals may see learning as a formal process where the teacher teaches students and the students sit and listen, although others might have had teachers that saw themselves as equal to learners.

According to the author, *learning* comprises of the following elements:

a) Learning can either be **formal or informal;** and b) people do not only learn **knowledge and facts** but also **skills and attitudes;** c) **People learn in different ways**; d) Learning can either be **superficial** (when it is memorized) or **deep** (ability to use new knowledge actively). But for e-astuteness and e-social astuteness adoption, this thesis suggests that teaching and learning should be deep; e) Understanding the **motivation** behind wanting to learn, for example it could lead to a promotion or gaining a new qualification. This thesis further suggests that the motivation behind learning is not important as long as the ultimate goal is acquiring new e-skills and being finally being deemed e-astute and/or e-social astute; and learning **continues throughout a person's life time**

***Teaching* comprises of the following elements:**

a) The teacher **decides what the student should learn** and this is determined by the job that needs to be performed**;** b) **The teacher helps the learners learn**, meaning that the teacher ensures that students learn the best way possible; c) The teacher needs to **make sure that the students have learnt**; and lastly teacher **looks after the welfare of her his/his students**. This thesis describes teaching as

something that can only occur when there is a teacher be it an inanimate teacher (e.g. a book or video) or humane via a physical person (e.g. a teacher).

The revised adoption model of e-astuteness and e-social astuteness is presented in *Figure 4*. The model is developed from the participant's views expressed in this thesis, the elements previously identified in the proposed adoption model in *Chapter 2* as well as Prozesky's views.

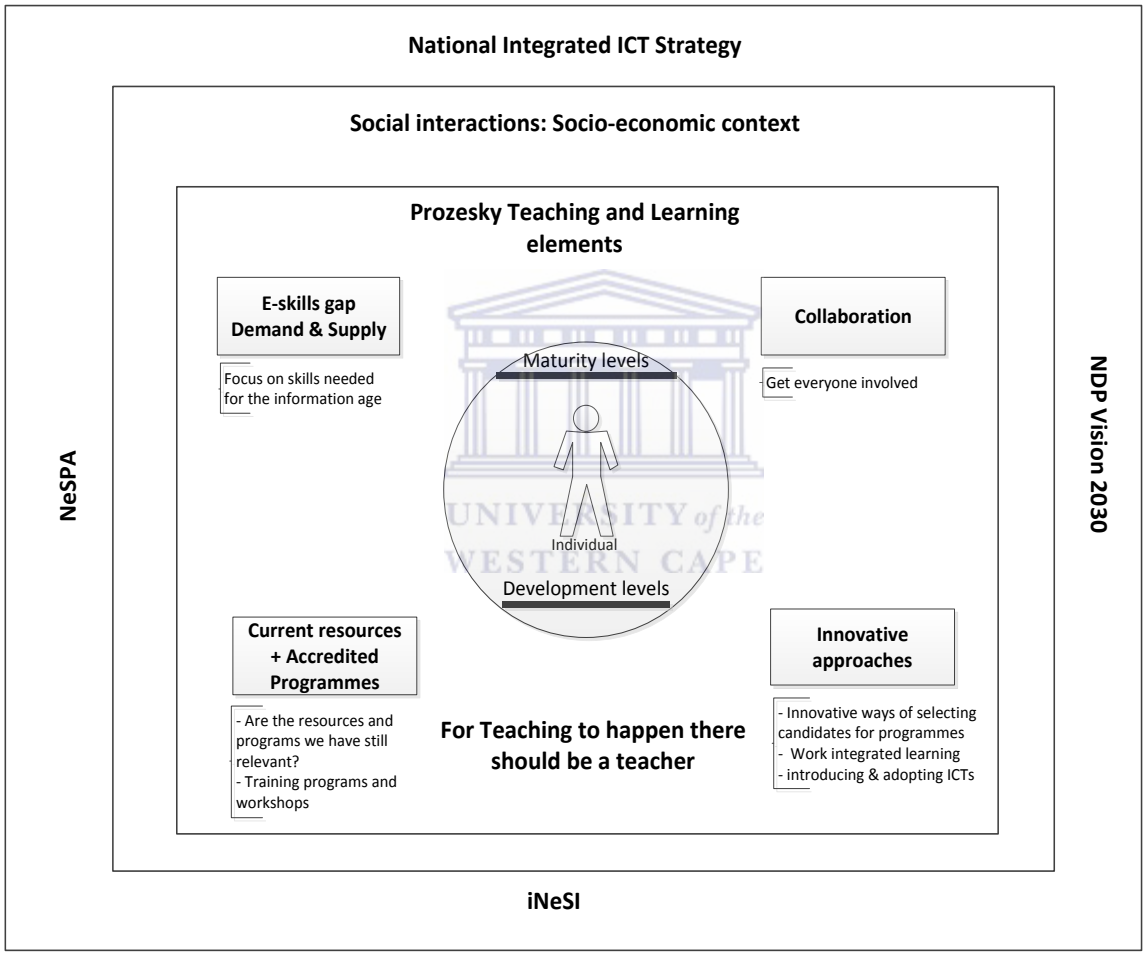

Figure 4: A revised adoption model of e-astuteness and e-social astuteness

Refer to chapter 2 for full description of the model

5.4 Implication of Findings

5.4.1 Academic

It was envisioned that because of the lack of knowledge about the concepts of e-astuteness and e-social astuteness, this thesis would help build a better theoretical and empirical understanding of these concepts in the South African teaching and learning environment. However, the main contribution of this study may be to assist government institutions and private organisations in their collaborative approach to better understand the perceptions concerning e-astuteness and e-social astuteness. Furthermore, developing the kills recognised to be linked to these concepts may be a focus by universities when drafting the curriculum - in order to ensure focus on e-astuteness and social-astuteness.

5.4.2 Practical

The proposed model may be applicable to other developing countries with similar socio economic problems that South Africa is facing, such as unemployment and poverty.

5.5 Limitations of this study

The sample group comprised of 20 students at the Information Systems department of a university in South Africa. Their views cannot be generalized to all students in the country, hence limited generalization are reflected in the findings. Furthermore, the study suggests how the teaching and learning process (e-astuteness) at this university can be improved, however this does not reflect teaching and learning in a broader South African context. Nevertheless, these limitations do not affect the validity of this study.

5.6 Recommendations for Further Research

The proposed adoption model for e-astuteness and e-social astuteness suggests that teaching and learning occurs everywhere people go. It could be in their homes, schools or even at work. More research should be conducted on the teaching and

learning during people's daily lives and how that may lead to e-astuteness and e-social astuteness. The study should focus on refining the proposed model in this thesis so that it is applicable to the entire South African context and not solely to those enrolled at universities.

Future studies should also focus on identifying the exact combination of personal and interpersonal skills that could be linked to e-astuteness and e-social astuteness.

5.7 Final Conclusion and Remarks

The interviews revealed that the students lacked an in-depth understanding of e-astuteness and e-social astuteness. Although the students have a sufficient understanding how the advances in technology influences the required skills, they were unable to identify these skills. The results make it apparent that while the country is at the core of addressing e-skills development by introducing concepts such as e-astuteness and e-social astuteness, the nation needs to be educated about these concepts – starting with the very basic. Even at university level, few people possess even the basic understanding of concepts such as e-skills.

However, unlike most developed countries, that do not have much pressing socio economic problems, South Africa needs to decide which pressing issues need to be resolved first: Unemployment and poverty, or underdeveloped e-skills. It must be taken into account that developing an e-astute and e-social astute nation may ultimately improve South Africa's socio-economic status.

If South Africa continues in their efforts to harbor an e-skilled nation, it may be comforting to know that the citizens are willing to learn and acquire e-skills and are well aware of the influence of technology. However, adopting the concepts of e-astuteness and e-social astuteness would require more than just willingness and awareness from the people. For e-astuteness and-social astuteness adoption, users that are willing to use ICT's are needed. The previously-mentioned quote from Nchunge, Sakwa and Mwangi (2012) regarding the way in which users perceive ICT's is able to influence the level of technology adoption, could be used as a starting point.

If South Africa aims to reach the vision of an e-astute nation or at least follow in the footsteps of continents such as Europe, the starting point would be for South Africa to continue making funds available for ICT and ICT education as well as the collaborative approach between public and private companies and government organizations, as mentioned by NeSPA 2013. Similarly to the white paper by Kolding and Kroa (2007), South Africa needs to understand that the efforts that are made to e-skilling the nation should address the future ICT skills that go beyond basic literacy skills.

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APPENDICES

7 APPENDIX A: INTERVIEW QUESTIONNAIRE

"A study of e-astuteness and e-social astuteness and their perceived validity amongst Information Systems (IS) students at a University in South Africa"

Interview Details

Participant NO.:

_____

Gender:

_____

Date and Time of interview:

_____

Interview Duration:

_____

Place of Interview:

_____

Level of study and modules registered:

_____

Section 1 – Understanding of E-skills

1. What do you understand about e-skills or ICT skills?
2. Do you think having e-skills is important? Why is it so?
3. Would you say you have e-skills of your own, what are they?
4. When would you say you acquired your e-skills and do you use these in your everyday life?
5. As an Information Systems student, what are the typical e-skills that you think are needed at this day and age?
6. As a current IS student, what do you think about the current teaching and learning environment at the university? Is the university doing enough to teach about e-skills and encourage the use of e-skills?

Section 2 - Understanding e-astuteness and e-social astuteness

7. Have you ever heard of the concepts of *e-astuteness* and/or *e-social astuteness?*

8. What do you understand about *e-astuteness* and/or *e-social astuteness*?

e-astuteness *is the capacity to continuously appropriate the technology into personal work, education, business, social and family contexts for both personal and collective benefit. e-astuteness is defined as a knowledgeable capacity, based on personal and interpersonal skills, that involves; understanding people and situations and building alignment and alliances.*

e-social astuteness *: is defined as the use of ICT and e-skills for more astute ways of people interacting with others, which include; social interactions, a level of awareness and understanding of diverse social situations and the various alternatives open to them for response.*

(iNeSI, Edition 26)

9. What is your willingness to learn about the concepts of *e-astuteness* and *e-social astuteness,* and why?
10. What types of e-skills in your opinion can be linked to e-astuteness and e-social astuteness?
11. What is your opinion about the current teaching and learning environment at the university?
12. What is your opinion about the possibility for the university to adopt the concepts of *e-astuteness* and *e-social astuteness? Do you think they can be adopted?* Please explain your answer?
13. In what way do you think these concepts can be introduced and adopted in the teaching and learning process at the university?
14. Do you think adopting these concepts in the teaching and learning environment might help further improve the e-skills levels of Information Systems students at the university? Please explain?
15. What is your opinion about the current Information Systems curriculum, do you think it is designed to keep up with the latest trends influenced by the **Information age/new media age?**

    A period in human history characterized by the shift from traditional industry that the Industrial Revolution brought through industrialization, to an economy based on information computerization. **(Wikipedia, 2015)**

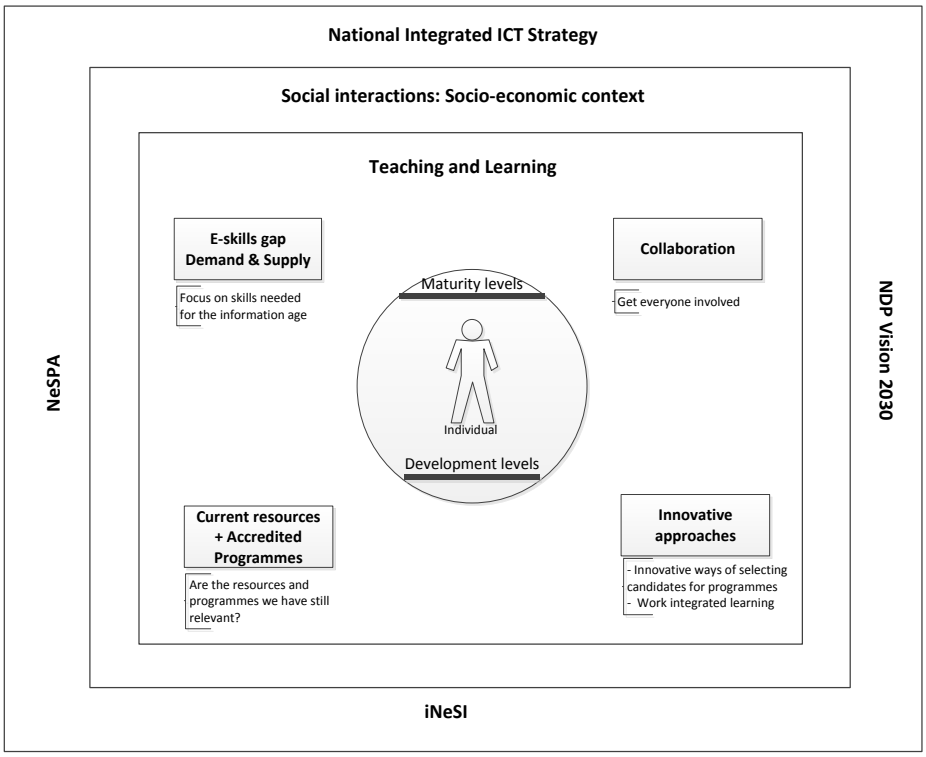
16. Do you think you possess the necessary skills required for the **information age**? Can you name those skills**?**
17. In your opinion, is the university engaging students by utilising e-astute/innovative ways of teaching and learning?

Section 3 – Plausibility of the proposed adoption model

18. What is your opinion on the importance of a collaborative policy making approach that involves the general public as well as private organisations in order to successfully drive *e-astuteness* and *e-social astuteness* adoption at universities? Please explain your answer?

    *Ikamva National e-Skills Institute (**iNeSI**) is a governmental approach to e-skilling that sits under the Department of Communication (DoC). According to the iNeSI website, the initiative is aimed at "enabling environment for a coordinated response to the challenges posed by the rapidly-expanding capacity, mobility, convergence and affordability of new information and communication technologies ICTs) and their impact on South Africa's competitive position.*

An adoption model of e-astuteness and e-social astuteness



The model depicts that at the core focus of e-astuteness and e-social astuteness adoption, there should be a teaching and learning effort which should concentrate on individual capabilities (Development and maturity levels). iNeSI identifies-astuteness as a teaching and learning component to e-skilling, with sub components that cover; filling the e-skills gap, collaboration, focus on existing current resources and accredited programmes and lastly the innovative approach. The second outer layer of the model shows the fit of e-social astuteness, which is as a primary construct primarily build upon e-astuteness. The last layer of the adoption model portrays the relevant policies/framework (ICT Integrated strategy, NDP Vision 2030, iNeSI, NeSPA.) which should continuously provide feedback to the core of the model

19. How do you think this model can be incorporated in the teaching and learning environment at the university?
20. In what way/s can this model be improved? Please explain your answer?

8 APPENDIX B: LETTER OF CONSENT

UNIVERSITY *of the* WESTERN CAPE

Department of Economic and Management Services

Letter of Consent

CONSENT FORM FOR QUESTIONNAIRE

I, ……., have had the opportunity to ask questions related to this study and obtained satisfactory answers to my questions.

I have also received any additional information that I may have requested about this research.

I agree to participate in this research.

I understand that my participation in this study is voluntary and that no remuneration will be provided in return for my contribution. I am free not to participate and have the right to withdraw from the study at any time without the need to provide any reason for such withdrawal.

I am aware that this study might result in research which may be published, but that my identity will never be revealed. It is my understanding that the researcher will ensure my anonymity throughout the research process.

I retain the right of refusal to answer any question which I do not feel comfortable or able to respond to.

Date: ……..……

Participant Name: ……

Participant Signature: ..……

Interviewer name: ……Silungile Mlambo…..……..

Interviewer Signature: ……

If you have any questions concerning this research, feel free to contact me: Silungile Mlambo, Cell phone: 0842287024 or my Supervisor Dr Zoran Mitrovic, Cell phone: 0729399512

9 APPENDIX C: AUDIO CONSENT

CONSENT TO AUDIO RECORDING AND TRANSCRIPTION

I understand that….

This study involves the audio recording of your interview by the researcher. Neither your name nor any other identifying information will be associated with the audio or the transcript. Only the researcher will be able to listen to the recordings.

The tapes will be transcribed by the researcher and kept for a minimum period, or until the transcriptions are checked for accuracy. Transcripts of your interview may be reproduced in whole or in part for use in presentations or written products that result from this study.

By signing this form,

I agree that my data can be used for presenting research findings for this study or any further analysis in future research projects [and/or for teaching purposes].

I know that neither my name nor any other identifying information (such as my picture) will be used in presentations or in written products resulting from the study.

Date: ……

Participant Name: ……

Participant Signature: ……

Interviewer name: ……Silungile Mlambo…..……

Interviewer Signature: ……...

If you have any questions concerning this research, feel free to contact me: Silungile Mlambo, Cell phone: 0842287024 or my Supervisor Dr Zoran Mitrovic, Cell phone: 0729399512

10 APPENDIX D: PARTICIPANTS INFORMATION

No	Date	Time	Duration	Gender	Level of Study
01	02/06/2016	15h21	20:51min	M	2nd Year
02	02/06/2016	15h48	17:55min	F	1st Year
03	03/06/2016	16h10	21:53min	M	2nd Year
04	04/06/2016	08h55	10:52min	F	3rd Year
05	04/06/2016	08h41	12:43min	F	3rd Year
06	04/06/2016	08h53	23:10min	M	1st Year
07	05/06/2016	11h00	29:05min	M	3rd Year
08	05/06/2016	11h56	27:10min	F	2nd Year
09	06/06/2016	16h03	22:40min	M	2nd Year
10	06/06/2016	16h43	17:18min	F	2nd Year
11	06/06/2016	16h58	23:03min	F	3rd Year
12	07/06/2016	10h44	16:05min	M	1st Year
13	07/06/2016	11h10	20:07min	M	1st Year
14	07/06/2016	11h40	20:59min	F	1st Year
15	07/06/2016	12h33	19:46min	F	1st year
16	07/06/2016	13h10	18:03min	M	Honours
17	07/06/2016	13h27	14:37min	M	2nd Year
18	07/06/2016	14h22	21:29min	M	2nd Year
19	07/06/2016	15h04	15:34min	M	2nd Year
20	07/06/2016	15h20	21:04min	M	Honours