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Multiple Symbolism of Information and Communication Technology (ICT) in Academia: A Case Study of Technical Vocational Education and Training Institutions in Cape Town, South Africa

by

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DECLARATION

I, Arthur Emil Van Der Poll, declare that the contents of this dissertation/thesis represent my own unaided work, and that the dissertation/thesis has not previously been submitted for academic examination towards any qualification. Furthermore, it represents my own opinions and not necessarily those of the Cape Peninsula University of Technology.

20 November 2014

Signed **Date**

ABSTRACT

It is well recognised that Information and Communication Technology (ICT) can enhance the quality of teaching and learning in tertiary education. Similarly, research has uncovered a range of factors that impede the successful adoption of digital technology for educational purposes. It remains unclear, furthermore, how educators in institutions of higher learning negotiate and frame their experiences with technology, and how this implicates the teaching and learning process. In this thesis, I will examine this problem, with particular focus on educators from Technical Vocational Education and Training (TVET) institutions in the Western Cape of South Africa. In addressing the research problem, I use symbolic interactionism as analytic framework to unpack and reconstruct the *meaningful engagement* with technology. Understanding the multiple symbolic meanings that arise from interactions with technology can illuminate the diverse and nuanced perspectives that underpin the use of ICT in teaching and learning. A symbolic interactionist lens can shed further light on the matter of adoption, and allow this research study to make a practical contribution to the introduction of ICT tools in TVETs.

To elicit and interpret the multiple meanings that TVET educators associate with ICT, I will employ *photo-elicitation methodology*, *observation* and *fieldnotes*, and *self-reflection*. Photo-elicitation involves participants taking photographs along the line of inquiry (e.g. the benefit of using technology to teach), after which they undergo a reflexive interview in which they reflect on the meanings of the photographs they have taken. I will couple direct participant observation (documented in field notes) with symbolic interactionism and photo-elicitation to contribute to the production of meaningful data. Finaly, I will apply guidelines of self-reflection by compiling a reflective journal. Self-reflection will allow me to reflect on my own thoughts about the social phenomenon under study and will enable me to understand how my own behaviour may affect the inquiry.

The meanings that emerged from the data were grouped into interactionist themes through which the engagement with technology is framed and understood. Educators are generally appreciative of the support and creative capacities that ICT provides to teaching and learning. They are however frustrated with their own inability to fully understand technology and the lack of support from government and institutional decision makers. Despite educators' struggles with ICT, they are determined to overcome challenges. These themes can be useful in the repositioning of technology for education in TVETs, and can support implementers and policymakers in more effective application.

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"…but those who hope in the LORD will renew their strength. They will soar on wings like eagles; they will run and not grow weary, they will walk and not be faint" (Isaiah 40:31).

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DEDICATION

Vir my Pa en Ma:

Sakkie en Mona Van Der Poll

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LIST OF ACRONYMS

CAI	Computer assisted instruction
DASSIE	Distributed Advanced Strategic System for Innovative blended E-learning
DoC	Department of Communication
DoE	Deparment of Education
DoHE	Department of Higher Education and Training
ESKOM	Electricity Supply Commission
FET	Further Education and Training
GDE	Gauteng Department of Education
HEI	Higher Educational Institutions
ICT	Information and Communication Technology
NCV	National Certificate (Vocational) Education and Development
NDOE	National Department of Education
NQF	National Qualifications Framework
NSFAS	National Student Financial AID Scheme
PDOE	Department of Communication
SCOT	Social Construction of Technology
TST	Twenty Statements Test
TVET	Technical Vocational Education and Training
WCED	Western Cape Department of Education

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CHAPTER 1

1.1 Introduction

It is well recognised that Information and Communication Technology (ICT) can enhance the quality of teaching and learning in tertiary education. Similarly, research has uncovered a range of factors that impede the successful adoption of digital technology for educational purposes (Czerniewicz & Brown, 2005; Jaffer et al., 2007; Dix, 2007; Hodgkinson-Williams, 2009; Hismanoglu, 2012). It remains unclear, however, how educators in institutions of higher learning negotiate and frame their experiences with technology, and how this implicates the teaching and learning process. In this thesis, I will examine this problem, with particular focus on educators[1] from public Technical Vocational Education and Training[2] (TVET) institutions in the Western Cape of South Africa.

Symbolic interactionism is used as an analytical framework to unpack and reconstruct the different and meaningful engagements TVET educators have with technology. Prasad's (1993) seminal study of symbolic interactionism indicates that technology represents diverse and complex meanings for the staff of an organisation. Understanding the meanings that arise from interactions with technology can illuminate the diverse and nuanced perspectives that underpin the use of ICT in teaching and learning. A symbolic interactionist lens can shed further light on the matter of adoption, and contribute to the development of theories and best practices for the introduction of ICT tools in TVETs.

The research presented in this thesis draws from an extensive study by Van Zyl (2013). Van Zyl employed symbolic interactionism as a theoretical and conceptual framework to explore the significance of 'technology encounters' in under-resourced primary education. Framed within the interactionist paradigm, I employ photo elicitation methodology to elicit and interpret meanings of technology in the TVET context. The methodology involves participants taking photographs along the line of inquiry (e.g. the benefit of using technology to teach), after which they undergo a reflexive interview in which they reflect on the meanings of the photographs they have taken (Magnini, 2006:78). By undertaking this research, I attempt to contribute to:

[1] "Educators" are the term used for teaching staff in South African TVET academia. I will use this term throughout the thesis.

[2] It should be noted that TVETs were formerly known as Further Education and Training (FET) institutions. The use of "FET" in this study should be considered synonymous with "TVET". The name change was made due to a shift in funding and administration norms of FETs (See Government Gazette Notice 775 of 2014 published by Department of Higher Education and Training, 2014)

- An understanding of TVET educators' experiences, views, attitudes, and assumptions toward using ICT for teaching and learning;
- An understanding of the extent to which TVET educators accept, reject and use ICT in their institution(s); and
- The conceptualisation (within a symbolic interactionism framework) of best practices to introduce ICT tools in TVETs.

1.2 Background to the research problem

Earlier research (Carter, 1984; Huber, 1990; Brynjolfsson & Hitt, 1996) viewed technology as an external *entity*, that is, technology was considered only as "hardware-discrete objects", distinct from the organisational and human activities (Orlikowski, 2009). These studies and scholars were ignorant of the notion that people socially interact with technology, or that they socially define and produce technology. Other studies (Zorn, 2002; Fulantelli & Allegra, 2003; Sørnes, 2005) approach research of ICT use in organisations from this social interactionist paradigm, challenging the notion of technology as only an autonomous, external entity. Findings suggest that people's utilisation, views and adoption patterns of technology are entrenched in the social, symbolic and cultural contexts of their organisation. It is within these contexts that I frame this research.

1.2.1 Social construction of ICT

Wanda Orlikowski is a recognised scholar who argued against technological determinism, and instead advocated the social constructionist views of ICTs (Zorn, 2002:3). Orlikowski criticises organisational research that views technology as an "exogenous force" with predictable and fixed impacts on human outcomes, decision making, work routines and individual productivity (2009:129). Challenging this notion, she instead argues for an "emergent process perspective", that is: people shape and define technology through social interaction. This perspective distances itself from exogenous understanding, and additionally requires the adoption of methodology that is grounded in the social, historical and cultural contexts of technological change. These contexts shape the meanings that individuals ascribe to technology.

Mlitwa (2006) and Bladergroen et al. (2012) examined the social construction of educational ICT in a South African context. Mlitwa (2006:3) criticises scholars that neglect to define socially constructed meanings of technology concepts in education. He believes that improved understanding of the meanings educators hold for technology could empower both

educators and students and stimulate teaching and learning more effectively. It is argued that an understanding of the connection between social needs of educators, and the value ICT can provide in teaching, results in positive ICT adoption. However, a discrepancy exists between the social meanings educators attach to technology and the actual use of technology in the educational context (Bladergroen et al., 2012:108). This misalignment has proved to be a barrier to meaningful ICT implementation.

1.2.2 Cultural construction of ICT

Culture as a set of deeply rooted beliefs, values, and ideologies shared by a group of people (Clark, 1980) also shapes and constructs the engagement with digital technology. Li (2014) and Chigona (2010) note how a deeply rooted cultural system has significant influence on the perceptions and performance of educators in ICT-supported teaching. This is why educators from developing nations, and with culturally anchored pre-beliefs, resist or struggle to adapt to pedagogical innovation from developing countries, in which technology plays a vital role and is considered a *revolutionary tool* (Khan et al., 2012; Arokiasamy et al., 2014).

In the attempt to study the role of culture, I draw from Goode (2010) to conceptualise the "cultural technological identity" of educators in the TVET context. Burke (2005) infers that such identity encompasses two meanings: symbolic meaning and sign meaning. The former is understood and shared by persons in the same culture. The latter is not shared among people, but perceived individually. In trying to understand the symbolic meanings TVET educators assign to educational ICT, I group Goode's technological identity along five aspects of TVET culture, namely:

- Educators' beliefs about their technological abilities;
- Educators' views about the importance of technology in academia;
- Educators' beliefs about the opportunities to use technology for knowledge construction;
- Educators' beliefs about the limitations of technology as an alternative teaching and learning method; and
- Educators' desire to become knowledgeable in (the use of) technology.

I provide empirical understanding of *cultural technological identity* in TVET educator context as follows: (a) I couple my own subjective perspective[3] of technological encounters

[3] My subjective perspective stems from my job position as the Head of Deparment of the Information Technology deparment of a TVET institution. I observe daily the encounters TVET educators have with digital technology. I elaborate more on my position in Section 1.3.2 *The Intellectual puzzle*.

educators experience; with (b) Tsolo's (2006)[4] findings and discussions adressing technological views and believes of educators at TVET colleges in the Gauteng province of South Africa:

- Young educators majoritarily are partly proficient using ICTs. These educators generally have a positive and willing attitudes towards technology as means of improving teaching methods.
- Educators considers the internet as a valuable asset and tool to do research and gain access to additional learning resources. However, limited internet and support with technical problems creates frustration, which in turn manifest negative ICT perspectives.
- Older educators mostly resist technological innovation. They avoid ICT use if possible and generally have pessimistic views and discourse about technological innovation.
- Limited ICT skills and knowledge is prevalent among educator staff and subsequently have a detrimentel effect on the quality of academic delivery and successful ICT adoption.
- Educators believe that decision makers do not provide sufficient support to better the technological experience of learners and lecturers. This creates mistrust and doubt about policymakers' ability to manage educational technology effectively.

Brown (2011:68) opines that the exploration of technological identity provides a useful perspective of the digital divide (and adoption patterns as a result), as it calls attention to cultural contexts in which an individual function. The "global digital divide", as defined by Van Zyl (2013:36), refers both to the physical inequality in the access of technological resources between nations, and a hegemonic (and often flawed) development strategy to address technological imbalances.

At the macro level, this supposed technological divide was the basis for the e-Education White Paper, jointly released by the South African National Departments of Education and Communication. According to this framework, however, the digital divide is not only about disparities in connectivity and infrastructure, it is also about (among other goals): "overcoming cultural inhibitions and insecurities about developing competence for surviving the breakneck speed of the Internet age and creating a risk-taking culture" (2006:9). Governmental policymakers are therefore aware of the influence educator culture has on ICT provision. The application of hegemonic intervention goals to the local educator environment seems inefficient in addressing challenges that emanate from cultural inhibitions.

[4] Tsolo (2006) conducted a similar study in the Gauteng Province and investigated the implementation and utilisation of ICT and E-Learning in public TVET colleges

1.2.3 Symbolic construction of ICT

I use a lens of symbolic Interactionism to examine how the meanings that TVET educators ascribe to technology affect adoption. Renowned sociologist Herbert Blumer coined the term "symbolic interactionism" in 1937 as a theory to explain "human group life and human conduct" (1969:1). He suggests three very fundamental premises that define the theory (1969:2):

- Humans interact with objects, and are motivated to behave according to the meanings they associate with or ascribe to those objects.
- The meaning objects have for humans originates from social interaction with other people or objects.
- Through an interpretive process, humans deal with and alter these meanings.

Despite Blumer's well-known discussions of symbolic interactionism, there is limited research that explores ICT adoption within a symbolic interactionist lens (Ojiako & Aleke, 2011:4). In fact, no symbolic interactionism research has been conducted about ICT adoption in the South African TVET context. Ojiako and Aleke note how knowledge about symbolic construction of technology by minority and indigenous groups remains largely un-investigated. This in particular motivates me to understand the meanings that a local and often peripheral educational community assigns to ICT. Furthermore, symbolism becomes even more complex as variations of symbolism exist within collective environments. It is for this reason that technology in a community, such as the TVET sector, exhibits a complex variety of sometimes opposing symbolism (Smith, 2006).

In Chapter 4 (Section 4.1), I explore in detail the different symbolism (and dissimilar views) that exist in the TVET educator community, by categorising TVET educators into different ICT "user types". The user types (adapted to an educational context from Birkland, 2013) provide a description of different type of technology users, the experience each user had with ICT, and other defining traits. This framework resonates with that of Czerniewicz and Brown (2005), and in particular, with their inference that educators generally agree that ICT for educational use is a valuable asset but are divided about the *role* of technology in education.

1.2.4 Towards defining a research problem

It is evident that educators' meanings of ICT are generally constructed and perpetuated through technology encounters at a micro level, which in turn act as social, cultural or symbolic signifiers during ICT adoption. However, lack of research and limited understanding of meanings that underlie ICT usage in a local educational group, such as TVET educators, leaves the intellectual puzzle unsolved. In this context, opposite discourses about the role and perception of technology as a teaching and learning tool dominate the South African academic environment. For example, misalignments transpire between the ICT directives of the institution and educators' actual usage of technology. Macro constraints such as the digital divide have prompted South African education bodies to initiate goals of invoking a culture that considers ICT a meaningful tool.

Herbert Blumer's symbolic interactionism theory will be central in addressing the research gap, as the approach will ground my objective of exploring the emerging meanings that relate to educators' technological encounters and adoption patterns in the TVET context. In Chapter 2, I discuss symbolic interactionism in detail. In Chapter 5, I attempt to narrow the research aim, with the intention to be explicit about the context in which technology is used for teaching and learning. To achieve this goal, I draw from Michalski's (2013) contemporary approach to symbolic interactionism, which focuses on ICT implementation in an educational context.

1.3 Rationale

It is against the backdrop of the social, cultural and symbolic contexts examined in the background to the research problem that I attempt to understand the intellectual puzzle. The intellectual puzzle, in turn, underlines the rationale of this research study. To broaden understanding, I will reflect on the role the South African education sector- through ICT development efforts- plays in the country's social and economic growth.

1.3.1 The role of the South African education sector in ICT for development

Van Zyl (2013:29) discusses ICT for development as a 'pracademic approach' in applying new technologies for societal gain. I am unable to deny, redundant as it may be, the positive and indispensable impact digital technologies have on the quality of teaching and learning practices, and consequently, the contributing aspects of technology to economic growth. The

application of ICT plays an intrinsic role to enhance efficiency in the learning environment by introducing a variety of tools such as e-learning, multimedia resources, specially created programmable software, email, blogs and online teaching offered via web-based systems (Czerniewicz & Brown, 2005). The ICT resources listed is considered especially essential in delivering education to an expanding *distance education* landscape (Department of Higher Education, 2014:53). Numerous studies (Akinsola et al., 2005; Kwache, 2007; Hennessy et al., 2010; Mdlongwa, 2012) highlight the potential benefits of ICT in education, under the condition that the method of technological intervention is rigorous. The benefits entail:

- ICTs such as learner management systems allow students and teachers to control, edit, share, collaborate and contribute to lessons, tasks, ideas, and assignments;
- Information and sources, especially for research purposes is easier to access on the Internet;
- E-learning software makes it possible for educators and students to teach and learn at their own pace, irrespective of location;
- Flexible, creative and user-friendly educational ICT may stimulate the interest of learners and educators, which in turn may inspire and sustain a deeper, enriched and continuous learning practice;
- ICT hardware such as interactive whiteboards and data projectors stimulate learning in a visual manner and allow educators to impart knowledge more effectively; and
- ICT facilitates a connection between educational institutions and the workplace, as it promotes competent workers capable of responding to demands of the new world economy that is supported by technology.

These claims motivate the South African government to funnel massive funding into ICT development in educational institutions. To support the strategy in the TVET sector and schools, national government has embarked on initiatives such as the *Dassie (Distributed Advanced Strategic System for Innovative blended E-learning) Project* (see Theron, 2009) and the "Teacher Laptop Initiative":

> In May 2009, the then Department of Education announced the "Teacher Laptop Initiative". This is part of a critical strategy to take forward the objective of improving information and communications technology (ICT) in teaching and learning. The initiative aims to ensure that every teacher owns and uses a laptop by providing them with a monthly allowance, which will cover the purchase costs as well as the costs of connectivity. The ICT package will consist of appropriate hardware and software, as well as Internet connectivity all with prescribed minimum specifications (Department of Communication, 2010:131)

E-policy frameworks, such as *South Africa's Investment into ICT in Higher Education and Opportunities for External Investment* (Mkhize, 2011), extensively outline the role higher education has in attaining goals of economic advancement at a global level. This publication further identifies the following detriments that threaten global solidarity and technological development: social exclusion, limited funding, poverty, education deficits and restricted ICT infrastructure. By implication, low bandwidth speed, high cost of technology infrastructure and lack of ICT knowledge obstruct ICT development in TVET institutions (2011:14).

South African education bodies designed measures to address challenges that impede ICT development and improve access to technology. They consider the increased availability of cloud services, bandwidth and affordable mobile devices such as smartphones, tablets and laptops critical to attain their goals (Isaacs, 2007; Department of Higher Education and Training, 2014:54). The Department of Higher Educations aims to improve ICT access by:

- Increased funding mechanisms, with the particular aim of upgrading ICT infrastructure.
- The introduction of various training programmes to promote ICT skills and literacy, with particular focus of improving educator training techniques and professional development.
- The introduction of various training programmes to promote ICT skills and literacy, with particular focus on eradicating educational disparities that manifested due to political, social and economic policies of the pre-1994 era.
- Establishment of competent leadership to manage ICT implementation, use and directives proficiently.

Despite claims of technological innovation to revolutionise learning and measurements to avoid *pitfalls*, outcomes of ICT development still disappoint when development goals are not realised. In Chapter 4, I attempt to address the question through empirical observation and empirically collected data. Davies (2007:19) points out that despite the diversity, reliability and accessibility of technology, technology continues to fall short in delivering gains in education. Davies suggests that the design of the experience, and method of intervention, and not the technology, has the potential to affect development and change in teachers and students (2007:20). She recommends a shift away from technology-centred focus, towards the adoption of a holistic approach that centres on the cultural and social environment of technology use by educators.

1.3.2 The intellectual puzzle

"…there need to be other ways of understanding and justifying technological diffusion. That the mere power of digital technology as a propeller of modernity and progress does not warrant its distribution at the grassroots. That its potential benefit as economic enabler does not supersede its meaningful engagement, no less its symbolic narrative." (Van Zyl, 2013:9)

Whilst the aforementioned actions and efforts by the South African government are laudable, the tenets of the "technological imperative" (Bladergroen, 2012:116) are evident in the expressed sentiments. This is the (often *blind*) perception that progress and improvement stems from the use of technology. Bates (in personal communication with Van Zyl, 2013) argues however, that the technological imperative is an "old fashioned" concept since technology generally permeates society. Bates recommends that we should rather determine the right and effective way to use technology. Nonetheless, in the quotation above, Van Zyl criticises the elaborate reliance on digital technology to instil notions of modernity, progress and socio-economic empowerment. The expectation from academia to integrate ICT into teaching and learning processes is evident from the intentions outlined in the e-education policy of the Department of Education (2004:8). Consequently, responsibility is placed on educators to be active role players in technology as means of advancing economic development.

It appears that the myriad social and cultural enabling factors that impede ICT adoption are not taken into account. Ironically, the measures taken to empower marginal groups (ICT illiterate educators, underprivileged education institutions, etc.) seem to marginalise them further by disregarding indigenous practices. This underlines the argument that decision makers do not realise the technological gap that occurs between developed and developing countries are not the only aspect that defines the digital divide, but also the gab that exists within nations- creating inequalities for marginalised communities (McCleod, 2005). This aspect of the digital divide is entrenched in complexities of what ICT means to certain educator groups, underpinned by cultural and social beliefs. It is these aforementioned factors, which grounds my analysis.

Furthermore, during my 8 years' experience as a TVET educator in information technology, it was evident that educator beliefs, views and uses of ICTs were essential factors in the culture of teaching and learning practices. Moreover, as a recently assigned Head of the Information Technology department, I play an integral role in the implementation of policy

mandates and ICT diffusion. While research continues to argue for the inclusion of end-users in policy formulation (Leacock, 2008; Loots, 2011), I found that educators continue to be excluded in decision making. In my opinion, this results in the discrepancy in ICT assumptions that reflect in policymaking goals, and the reality of ICT practice in classrooms.

As an Information Technology educator from 2005, I experienced first-hand, and was directly involved in the complexities surrounding ICT implementation. I became familiar with the TVET educator culture, which translates in technology adoption. I was always interested in the various educator, student and management discourses around ICT implementation for educational and administrative use. This, coupled with the research objective of this research study, created the intellectual puzzle of understanding the meanings TVET educators assign to ICT, and as a result, how these meanings can shed light on ICT adoption. In this context, where little is known about ICT adoption in TVETs, the use of the symbolic interactionism paradigm and the photo-elicitation methodology may provide substantial understanding into the meaningful use of technology in TVETs.

1.4 Purpose and objectives of the Research

If TVETs aim to adopt ICT successfully, policymakers need to recognise that educators have social encounters with technology. From these encounters, meanings emerge. Understanding how these meanings relate to ICT adoption can provide insight and analysis of contextual factors that impede or contribute to technology adoption. In recognition of the aforementioned, the purpose of this qualitative explorative study, through a lens of symbolic interactionism, is to seek rich and contextualised understanding of the meanings educators ascribe to ICT. Additionally, the study will establish how meanings affect the adoption of ICT in TVETs.

A number of authors (Czerniewicz & Brown, 2005; Mlitwa, 2006; Chigona et al., 2010; Bladergroen, 2012) investigated the meaningful influences of technology, particularly in the South African education context. These studies were, however, conducted in school and university settings. Therefore, there is a research gap in terms of how ICT adoption and diffusion are symbolically negotiated in the TVET context. The findings of this research study can be used for the development of “evidence-based policies in ICT intervention” (Bladergroen et al., 2012:108). These policies can inform technology policymakers in TVET about ICT symbolism prevalent among educators, which in turn, may lead to:

1. An increase in technology uptake (Van Zyl, 2013:98);
2. Attainment of ICT "impact" measures concerning teaching and learning practices, resulting in better understanding of the role and effects of ICT in education (Van Zyl, 2013:99);
3. Increase involvement and representativeness of educators in decision making of ICT innovation (Leacock, 2008:17).
4. Improved utilisation of technology embedded in goals of improving teaching and learning methods (Department of Higher Education, 2014:53).

Based on literature put forth earlier in the background to this study, I will therefore endeavour to- as Michalski (2013:17) puts it- "focus less on technology issues" but rather recognise that technology functions as part of a richer dialog between sociology and pedagogy. Hence, the contribution of this research study to the literature of symbolic interactionism: exploring the symbolism of ICT in TVETs. Van Zyl (2013:28) maintains that a series of technological encounters "are not mere utilitarian representations or loose associations", but rooted meaningfully in a wider narrative of symbolism. This will ultimately shed light on the local context of ICT in educator practice. Consequently, at the behest of the photo-elicitation methodology, participants project their technological encounters through visual narratives of symbolism- photographing people, objects (tangible or intangible), or elements (natural or abstract). Ultimately, my symbolic narrative based on interpretation of participant meanings, and participants' visual narrative of symbolism, serves to expand and rigorously underpin the purpose of this study.

1.5 Statement of research problem and questions

Educators in TVET institutions associate and construct multiple symbolic meanings in respect of information and communication technology. It is not known how these meanings affect the adoption of ICTs in these institutions.

The following research questions will guide the research study:

1. What are the multiple symbolic meanings in TVET that educators associate with ICT?
2. How do these symbolic meanings affect the adoption of ICT by TVET educators?

The following approaches are employed to address the research questions:

- *Photo-elicitation methodology*: I asked the participants to project the meanings they ascribe to technology through photographs. Participants photographed people, objects or

elements (within the correct ethical boundaries) that represents the meanings they associate with educational technology. Following the photography phase, I conducted reflective interviews during which participants reflect on meanings of the photographs they produced (Hall, 2007:3). In Chapter 3, I provide a detailed account of my experience with the data collection techniques related to the photo-elicitation methodology.

Figure 1 below provides a preamble of the diverse meanings that educators ascribe to educational technology. This photo and response of Emilia (a participant and TVET educator), epitomises the three overarching themes that emerged from participant data. The three themes are *Appreciation*, *Frustration* and *Perseverance*. During educators' technological encounters, they simultaneously experience beliefs, thoughts and emotions entrenched in these (often opposing) themes. Hence Emilia's expression, "I have conflicting feelings towards computers". This expression also represents the multifaceted complexities related to meaning construction of ICT. In Chapter 3 and Chapter 4, I extend discussion about thematic analyses and meaning making in the context of this research inquiry.

Figure 1: Emilia – the multiple symbolic meanings she ascribes to educational ICT

> For me, the oldness and rusty parts represents the confusion that is going on inside my head, because I do not always understand what I am busy with if I use a computer. At the same time however, I can see that there is an element of beauty and functionality in the shiny parts at the front, which is actually still beautiful. Also the fact that the flowers are growing through it. Regardless of the fact that I sometimes associate computers with things that is confusing, ugly and frustrating- there is definitely elements that is of value to me. The overall pic has something of everything. My big picture of computers; there is definitely chaotic parts, but there are also parts that I understand and appreciate. It is a combination of things; some of it that works for me, but there are also things that do not work so well and that is irritating. I have conflicting feelings towards computers (Emilia, TVET1).

- *Observation and field notes*: "Social science researchers study their surroundings regularly and repeatedly, with a curiosity spurred by theoretical questions about the nature of human action, interaction, and society" (Adler & Adler, 1996:377). This quotation from the Adler's, which exemplify observation as a data collection technique, instils confidence in satisfying my "curiosity" about the intellectual puzzle. Moreover, the quotation alludes to a directive in addressing the "theoretical questions" about meaning and adoption patterns in the TVET environment. Discursively, the quotation typifies symbolic interactionism insofar its reliance on direction observation of human action and interaction to undercover symbolic meaning (Denzin, 2009: 8). Hence my decision– in a pursuit to produce rich and meaningful data- to couple direct observation (documented in field notes) with symbolic interactionism and photo-elicitation.

- *Self-reflection*: Symbolic interactionism is not a rigid or universal theoretical framework, but a multi-dimensional perspective (Van Zyl, 2013:11). Consequently, empirical interaction and analysis in this research study might challenge and reengage the fundamental underpinnings of the interactionist paradigm. Watt (2007:83) noted how reflexivity permits a researcher to identify reciprocal connections between a research study's theoretical assumptions and empirical practice. She points out how writing down notes and ideas during the research project leads the researcher to discovery things they did not know were there. I believe this assertion Watt put forward, is how self-reflection can contribute to the re-evaluation of theories in the interactionist framework.

1.6 Limitations, scope and delineation

Although findings of this research project are not generalisable outside the selected sample (two Western Cape TVET institutions), results of this paper are transferable to other TVET institutions across South Africa. I consider transferability of results valid due to similar social and cultural settings that prevail in other TVETs. For example, results from a research study Tsolo (2006) conducted at a TVET institution in Gauteng produced similar social and cultural challenges that educators encounter when they engage with technology: the digital divide, lack of infrastructure and connectivity, limited ICT knowledge and skills, and limited access to digital technology for students. I provide a detailed discussion in Chapter 3.

Personal researcher and participant bias may have been projected into the data. Educators' deeply rooted beliefs of ICT may have resulted in selective, partial and prejudice views of technology for educational purposes. Additionally, I may have conducted interpretation of meaning in support of my ideologies, by selecting literature and participant data that confirm my beliefs. Moreover, all participants, except one, responded to the interview questions in their mother tongue *Afrikaans*. The correct context of meaning may have been *lost in translation* to English. I extend discussion on these limitations in Chapter 4.

1.7 Ethical considerations

I had no difficulty dealing with standard ethical issues such as informed consent, voluntary participation, anonymity and confidentiality. The biggest ethical challenge was getting different levels of consent during the data-gathering phase. Researchers who employ photo-elicitation methodology should not only consider direct participants, but also people and objects their participants decide to photograph. To ensure the second level of consent is obtained, I asked participants to present third parties with a consent card (Appendix C) which they must sign to confirm permission for themselves or the things they own to be photograph. A more detailed discussion will following in Chapter 3, in the section titled *Ethical considerations*.

Chapter 2

2 Literature review

2.1 Structure

The chapter is organised into three sections, each of which discusses the following: (1) a brief history, vocabulary, theories, and methods relating to Symbolic Interactionism; (2) Symbolic Interactionism and Human Computer Interaction, (3) Symbolic Interactionism and ICT adoption in South African higher education; and (4) Photo-elicitation as a research methodology. The main discussions are organised into subsections to extend and give substance to the body of theories. In addition, these subsections aim to provide a sound basis for addressing the research questions.

The *Taxonomy of Literature Reviews* by Harris Cooper (see Table 1) offers a frame of reference for this literature review. Cooper suggests six characteristics, each respectively supported by different categories, to present a literature review. This introduction briefly discusses the characteristics and categories this literature review aims to achieve.

Characteristic	Categories
Focus	▪ Research outcomes ▪ Research methods ▪ Theories ▪ Practices or Applications
Goal	▪ Integration ▪ Criticism ▪ Identification of central issues
Perspective	▪ Neutral representation ▪ Espousal of position
Coverage	▪ Exhaustive ▪ Exhaustive with selective citation ▪ Representative ▪ Central or pivotal
Organisation	▪ Historical ▪ Conceptual ▪ Methodological
Audience	▪ Specialised scholar ▪ General scholar ▪ Practitioners or policymakers ▪ General public

Table 1: The Taxonomy of Literature Reviews (adapted from Cooper, 1985)

The *Focus* of this chapter concerns the following:

(a) *Research methods*. I examine and differentiate between the theoretical stances (and associated methods) of symbolic interactionism put forth by influential scholars in the field such as Herbert Blumer, Manford Kuhn, Carl Couch, Jan Stets and Tom Burke, and Norman Denzin.

(b) *Research outcomes*. The chapter highlights the key considerations that underlie the different outcomes of the photo-elicitation methodology. The overarching scholarly perspectives may be adopted throughout, notably in the role photo-elicitation has in creating and interpreting meaning.

(c) *Theories.* The review provides the foremost theoretical considerations of the interactionist paradigm and the photo-elicitation methodology. These positions will ground the subsequent research design, of which I provide a detailed discussion in Chapter 3.

(d) *Practices or Application*. Norman Denzin's (2009) methodological principles provide a guide for conducting studies in the interactionist paradigm. These principles root the evaluation of the data collection and analyses techniques employed in this research study.

The chapter follows an *identification of central issues* method to reach its *Goal* of generalising findings of symbolic interactionism across ICT use in the education sphere. Additionally the literature review will connect the gaps in symbolic interactionism theories of ICT in education, by presenting a common linguistic framework. The *Perspective* of the literature review is the *espousal of position* as the research advocates particular paradigms, theories and methodologies in an attempt to address the research questions successfully.

The *Coverage* of the literature is *Pivotal*, as the focus is only on seminal articles and influential authors (listed above) in the field of symbolic interactionism. Manis and Meltzer (1967:1) affirm, "A brief exposition cannot trace every source of symbolic interactionism, nor can it fully describe each of the cited sources". The University of Houston (2014) defines seminal articles as "those articles where an idea is first established or an author first presents their 'big idea' in a subject that gets major attention in their discipline". The university suggests that scholars conduct a citation reference search to track the citations of influential articles. For example, Google Scholar (2014) indicates that 14534 research articles to date cite Herbert Blumer's *Symbolic Interactionism: Perspective and method*. This indicator signifies the seminality of Blumer's work.

The *Organisation* of the literature review will conform to a *Conceptual* format an attempt to explore the various ICT theories in literature. The primary *Audience* of this literature review are the reviewers of the dissertation, technology policymakers and implementers in academia, educators, and scholars conducting research in the ICT for education field.

2.2 Symbolic Interactionism

2.2.1 A theoretical framework of symbolic interactionism

The term “symbolic interactionism” covers two concepts: symbol and interaction. Symbol denotes social objects such as a verbal expression, bodily expression or a physical object that represents meaning for something. Interaction indicates the role of interpersonal communication in interpreting the meanings of symbols. During interaction, people share meanings that are always subject to constant change and interpretation. The continuous interpretation generally deploys language as the shared symbol. To make sense of their world, people use symbols, which express the meanings of different objects. These meanings affect how people interact with the objects (Tan, 2003).

George Mead is widely considered as the architect of Symbolic Interactionism in his vastly influential book *Mind, Self and Society* (1934). Drawing from the fundamental premise of Mead’s approach, Herbert Blumer laid claim to the term “Symbolic Interactionism” in 1937 (Loconto & Jones-Pruett, 2006:77). He describes the approach as relatively distinctive for sociological inquiries into human groups and human conduct (Van Zyl, 2013:60). Blumer delineated his theories of symbolic interactionism to a more detailed and lengthy ideology in his 1962 publication *Society of Symbolic Interaction* in which he defined symbolic interactionism as follows:

> The term "symbolic interaction" refers, of course, to the peculiar and distinctive character of interaction as it takes place between human beings. The peculiarity consists in the fact that human beings interpret or "define" each other's actions instead of merely reacting to each other's actions. Their “response” is not made directly to the actions of one another but instead is based on the meaning that they attach to some actions. Thus, human interaction is mediated by the use of symbols, by interpretation, or by ascertaining the meaning of one another's actions (1969: 79).

To summarise the definition, Blumer (1986:2) presents three premises, which together, form the basis of symbolic interactionism. Firstly, people act toward objects based on the meaning that those objects have for them. Secondly, the meanings people attribute to things/objects

arise from social interaction. Thirdly, through an interpretive process, and in a specific situation, people manage and change these meanings (Williams, 2008: 850-851). Blumer (1969:6) added “six root images” to these three premises: (1) “the nature of human society or human group life”, (2) “the nature of social interaction”, (3) “the nature of objects”, (4) “the human being as an acting organism”, (5) “the nature of human action” and (6) “the interlinkage of action” (McLuhan, 2009).

The first root image (the nature of human society or human group life) denotes that symbolic interactionists should commit to investigating the interaction occurring in a specific social group. The actions that members of a group perform actions are successive, instantaneous and always change. The individual and collective action – through a process of support, opposition and influence by others – either fails to, or succeeds in becoming part of the continuous actions in the group. Therefore, social life in groups arises from activity. Therefore, the theories and concepts sociologists apply are only valid insofar as interactions and activities become clear in a social structure (Manning & Smith, 2010: 38).

The second root image (the nature of social interaction) assert that sociologists should focus more attention on social interaction, since social interaction forms the basis from which different forms of human behaviour arise. Furthermore, social interaction is fundamental in the on-going development of a social group. Through interaction with others - and taking into account their behaviour and actions - a human being re-examines, validates, intensifies, changes or suspends their own behaviour. Blumer laments sociological theories that consider interaction only as a medium that conveys attributes of social behaviour (Manning & Smith, 2010: 38).

The third root image (the nature of objects) holds that three types of objects make up the social world. People assign meanings to these objects, which might later change. These three types are: (a) the physical (for example laptops, trees or chairs), (b) the social (for example friends, family or colleagues), and (c) the abstract such as feelings, moral principles or beliefs (Manning & Smith, 2010:39). For Blumer, the principal theory of all objects lies in the meaning the object has for the individual for whom it is an object. He ascertains that the meaning that an object has for a person arises from social interaction with others in the group (Manning & Smith, 2010: 39).

The fourth root image (the human being as an acting organism) suggests that a person is a holder of a self or an identity. Blumer implies that a person can be an object of his own image and interact with himself. With this concept, Blumer (1969:14) rejects positivist approaches

that suggest psychological attributes or “a play of factors” in a social setting produces human behaviour. Instead, symbolic interactionism views a human “as an organism that has to deal with what it notes” (Blumer, 1969:14). The central argument is that a human engages in self-indication by making an object of what it notes, assigns meaning to the object, and directs his/her actions based on the meanings (Manning & Smith, 2010: 39).

The fifth root image (the nature of human action) puts forth that a human interprets and reinterprets meanings as the social world is always constructed and reconstructed. Humans find themselves in various incidences in which they build and map out “projected lines of action” (Blumer, 1969:15). These processes affect the manner in which a person constructs and directs action. Again, Blumer discards arguments in psychological and social sciences that certain factors (for example attitudes, status and motives) initiate action. These factors should be taken into account but do not ultimately explain human action. To understand an actor’s action, investigators have to get inside the process, as it is being defined (Manning & Smith, 2010: 39).

The last and sixth root image (the interlinkage of action) accentuates that the actions of members of a group link to form “joint action” (Blumer, 1969:17). Joint action highlights the diversity among participants in a group. Albeit a composition of diverse actions and participants, joint action differs from individual action and its sheer accumulation. Joint action acts as one, is self-sustaining, becomes well established and a predictable entity. For example, a congregation at a church service is familiar with the responses expected of them (Manning & Smith, 2010:39). Blumer cautions that investigators still need to be aware that the joint actions are because of the formation of the meanings of each respective member of a group. Respective members of a group and their meanings should receive individual attention (McLuhan, 2009:29-20).

Blumer (1969:17-19) additionally presents three important observations on the implications of joint action (Manning & Smith, 2010:39). Firstly, because joint action becomes a set and repetitive process in certain social group lives, some scholars view joint action as common practice within these groups. Blumer cautions against such a view since meanings that underlie joint action always undergo interpretation, and are therefore always subject to change. Existing group rules are not always adequate for changes, as “it is the social process in group life that creates and upholds the rules, not the rules that create and uphold group life” (Blumer, 1969:19).

Secondly, because joint action enables a group to become self-sustaining and self-functioning, sociologists neglect to focus attention on the participants within the group. Scholars view these groups with well-organised members and diverse activities as functioning in a complex but efficient way. Blumer asserts that this notion is a serious mistake, since the actions - based on the meanings - of diverse participants in a group, are fundamental to the functioning of a group. Multiple meanings merit understanding, since it leads to certain actions and behaviour by people. Moreover, meanings occur in a unique setting that is part of a localised process in symbolic interactionism. These meanings are shaped, sustained, altered, reinforced and weakened through social interaction (Blumer, 1969:19).

Finally, one cannot understand present or new forms of joint action without analysing the joint action that preceded the new form. Joint actions have a historical linkage and background, therefore they do not spontaneously generate from nothing. New forms of joint action emerge from the previous action of group members' social construction of objects, multiple meanings and patterns of interpretation. Although new joint actions can arise from intense and significantly different scenarios, which in turn result in joint actions that remarkably differ from the preceding ones, there are still connections and continuity with the prior joint action (Blumer: 1969: 20).

2.2.1.1 Summary

In the aforementioned section, I presented the nature of symbolic interactionism and attempted to identify the guiding ideologies of its methodology in the context of empirical research. The section strongly focused on Blumer's view about the importance of meaning and human behaviour that account for various forms of human conduct. It is noticeable that Blumer deplore psychological perspectives about the origin of meaning. He rejects psychological factors such as stimuli, attitudes and other cognitive inputs to explain meaning. He disagrees with psychological dogma that view meaning as being a natural part of an object, or that meaning can emanate from an object by itself as if there is no process involved in its formation. Instead, he argues for different sources from which meaning emerge; according to Blumer meaning emerge from the interaction between people i.e. how people act towards one another regarding objects. Their actions during interaction define the meaning for an object

Essentially, symbolic interactionism views meaning as a social product, a creation forged from activities that occur during interaction. Blumer again rejects psychological thinking that regard the use of meaning as a psychological expression. Interactionist sees meaning instead as an internalised social process involving a person that interacts with the self. This process of self-communication becomes a process of interpretation. The process involves a person selecting, validating and altering meanings depending on the setting he finds himself in or a chosen action. Blumer's three premises of symbolic interactionism form the basis of this summary, which he considered distinctive and seminal for the development of an analytical structure of human behaviour.

2.2.2 Methodological principles

Norman Denzin (2009) presents seven methodological principles to evaluate theories and methods in symbolic interactionism. The principles illustrate that researchers should evaluate methodological and theoretical principles used in sociology to avoid gabs between theory and method. The principles illustrate that: (a) each method used in the interactionist framework takes on unique meaning and are only relevant to the theoretical framework; (b) if the interactionist apply different epistemologies from the scientific method, he or she can identify the most effective way the method can serve the interactionist theory; (c) methods can be used to approach and act on the social environment, subsequently giving meaning to the environment (2009:6).

The first methodological principle stipulates that symbols and interaction must consolidate before the completion of the investigation. Denzin prefers direct participant observation and consider qualitative techniques (For example attitude questionnaires) as insufficient in capturing patterns reflective of symbols of group behaviour. *The second methodological principle* suggests that symbolic meaning is inherently subjective of a human's reflection of the self. The principle recommends that interactionists capture the nature of the self, that is, that the interactionist takes the role of the participant ("the acting other") into account in the natural social environment. This entails activities such as learning the dialect of the participant and capturing his noticeable views of the self (Denzin, 2009: 8).

The third methodological principle proposes that the interactionist, after capturing the nature of the self, jointly connects conceptions of the self and symbols with the social groups and relationships that support these conceptions and symbols. The investigator must demonstrate how the meaning that a group member holds, relates to meanings that others in a group hold. *The fourth methodological principle* holds that interactionist must capture the

dynamic settings and environments in which a behavioural observation of group members occurs. Settings differ in terms of group rules and norms, and this, in turn, influences interpretation and behaviour. A person might find themselves in these different settings, that is, being a member of multiple groups. The principle illustrates the social self as a "situated object" that reflect continued interpretations of various social environments. (Denzin, 2009:9).

The fifth methodological principle suggests that research methods must reveal continuous change as well as non-change in behaviour. In order to understand behaviour, the investigator needs to examine the different sequence of steps through which user behaviour progresses, as each step constitutes the next step. *The sixth methodological principle* holds that interactionist should view the research they conduct as an act of symbolic interactionism. The theories and methods they implement, and their consequential findings and discussions, should convey meaning. As mentioned earlier, shared meanings only occur among a group of people if there is consensus about the interpretation and reinterpretation of an object. In this context, research theory and methodology for interactionists becomes the means of interaction in a social environment (Denzin, 2009:10).

The seventh methodological principle suggests: (1) "…the proper use of concepts is at first sensitising and only later operational;" (2) "further, the proper theory becomes formal;" (3) "and last, the proper causal proposition becomes universal and not statistical". The interactionist should leave sensitizing of concept analysis nonoperationalised until the investigator can familiarise him-/herself with the processes representing it, and the meanings participants attach to it. Operationalised concepts refer to concepts measured on a scale, or through observation. Once the meaning is determined, the investigator can employ multiple research methods to measure its characteristics (Denzin, 2009: 11).

2.2.3 Varying methodological stances

Interactionists often debate the differences in methodological and theoretical stances between various schools of thought. This review however only examines the diverse viewpoints to express transparency and understanding of methodology that is active in symbolic interaction. These bodies, or schools as they are generally referred to, suggest different conceptualisations of human behaviour, interpretation and meaning making during social interaction. The writings of the chief progenitor(s) of each school delineate the differences in substantial methodological matters. The progenitors and schools are (a) Herbert Blumer -Chicago School (discussed in Section 2.2.1), (b) Manford Kuhn- Iowa

School, (c) Carl Couch- New Iowa School, (d) Jan Stets and Tom Burk- Indiana School, and (e) Norman Denzin- Illinois School (Pascale, 2011:84-86).

Kuhn (Iowa School) viewed human behaviour as socially constructed. They did not focus on the internal conversation with the self but instead suggested that modification of techniques, such as surveys and attitude scales, can convert self-attributes into measurable variables. Kuhn created a pencil-and-paper measure to test internal meanings, known as the TST (Twenty Statements Test) (Wise, 2009: 42-44). Kuhn explicitly rejected direct participant observation (Meltzer et al., 1975:43). Direct involvement of the observer might affect the setting they investigate (Wright & Losekoot, 2003: 420; Guest et al., 2013:84). Carl Couch developed a quantitative variation of Kuhn's symbolic interactionism approach known as the New Iowa School. They distanced themselves from the TST and collected data by videotaping interactions in a structured environment. The structured environment offered the benefit of repeated viewings, allowing the capturing of precise patterns of behaviour. (Adler & Adler, 1996:384; Williams & Kirschner, 2012:22).

Jan Stets and Tom Burke (Indiana School) focused on "identity theory" which examines how social roles and identities links with behaviour. The context of these roles and identities refer to the position a person designates to him-or herself and others in relation to a specific reference group. For example, a father views himself in relation to his daughters, or a Professor's view of himself is in relation to his students (Burke, 2005). Each reference group, through daily interaction, share a range of meanings and behaviours that is inclined to be consistent over space and time (Olivier: 2013:411). In these settings and processes, patterns commonly become noticeable in meanings, the self becomes definite, and a chosen action becomes clear (Visagie et al., 2011:112). These settings however, do not necessarily dictate that pattern of behaviour and meaning become establish in a group setting, as not all members of the group identify, adopt or reflect the common ideas or practices of the group (Aneas & Sandin, 2009).

Norman Denzin and the Illinois School directed symbolic interactionism, from a psychoanalytic perspective, towards emotional and cultural influences in everyday interaction. Symbolic interactionists, from a "social-physiological" perspective have shown interest in the internal emotions that arise from a social setting. In fact, they insist that emotion affects behaviour and is inseparable from "the social". If a person feels that a particular behaviour is unsatisfactory, the person will reposition him-/herself through emotion to an acceptable position (Fields et al., 2006). Symbolic interactionist is also concerned with role-taking emotion. Role-taking emotion holds fast to the concept that a human will adjust

the self in response to emotions they undergo such as embarrassment, guilt, shame and empathy. For example, members of a group will put themselves through the effort of ridding themselves from the shame that others in a group associate with them (Fields et al., 2006).

2.2.4 Symbolic power

At a meso level, symbolic construction of technology is subjected to power relations and organisational determinism. Organisational leaders and ICT knowledgeable individuals with "symbolic power" (Michalski, 2013:4) often neglect to involve other stakeholders during certain phases of ICT implementation. Their objectives for control over certain ICT assets explain why empowerment of other users translates merely in the evaluation of ICT instead of detailed investigation of how ICT is truly used, perceive and experienced (Sharpe et al., 2010). Prasad (1993:1422) explains that technological determinism can be ascribed to managers' ignorance of the multiple symbolism associated with any technology, as such; they are only inclined to focus on the utilitarian benefits technology offers. By implication, this leaves some end users the option of only accepting or rejecting ICT (Michalski, 2013).

Moreover, implementers and strong supporters of technology, in many instances, *force* implementation by projecting a hyperbolic positive image of technology. Prasad (1993:1423) characterises this symbolic act as "romanticism". She rejects this notion of over elevating technological benefits, as it could result in a lack of focus on the technology's dysfunctions (1993:1425). In the two samples below, Tracey Leacock (2008) illustrates technological determinism and symbolic romanticism that contribute to construction of technology in an educational context.

> An educator who has recently attended a workshop in which many users of a new technology – such as an online discussion tool – provided glowing examples of how that tool has improved learning at their institutions would likely find it relatively easy to imagine successful outcomes. Another educator who has little or no experience with online discussions, on the other hand, would find the descriptions of effective student activities that used this tool more difficult to imagine (such outcomes would be less available), and such approaches would also tend not to look like (be representative of) what this person thinks good education is. Making a deliberate effort to involve all of the decision makers in generating both positive and negative outcomes of a particular decision will help to make a broader range of possible outcomes more accessible and will also help to bring to light underlying assumptions, such as individual perceptions of what constitutes effective education (2008:117).

> The introduction of ICTs can result in significant changes in the way an institution or an instructor approaches teaching and learning. This can, quite reasonably, lead to concern over managing resources and ensuring the well-being of students. A decision maker who approaches an ICT decision by first considering benefits is likely to have a more positive affective response and down play the potential risks, compared to another decision maker who approaches the same decision by first considering risks (2008:119).

2.2.5 The symbolism of anthropomorphism

Prasad (1993:1420) discusses an unconventional approach to the symbolic construction of ICT, namely "the symbolism of anthropomorphism". The concept entails the humanisation of computers by people. Humans place confidence in technology to perform tasks effectively with a humanlike mind (Waytz et al., 2014). Prasad reports how technological anthropomorphism has unintended risks as it can result in disappointment if technology does not fulfil people's expectation of intelligence.

She observed how participants blamed a computer for wrong data that was entered into a computer. She considers this mistake a human error. The "symbolic reality of humanness" was so intense that the computer was blamed and referred to as a "dumb machine" (1993:1421). This is in line with the study of Waytz et al. (2014:5), describing anthropomorphic increases in trust in a person's ability to perform tasks. Increased trust, however, in an autonomous agent (for example trust in the abilities of ICT) mitigates responsibility of a person's involvement in an undesirable outcome. In Chapter 4, I provide empirical data that further explains this theory of anthropomorphism.

2.2.6 Symbolic interactionism and human computer interaction

The application of symbolic interactionist concepts and methods is common in the design of interactive systems and address the social dynamics of human behaviour that result from interaction with ICT. The method of approaching and contextualising an interactive computer system "is as much social as technical". A user and the developer of a system essentially interact through a system as one, and can therefore consider the system as a form of mediated communication. An objective of developers is to design a system that a user can make sense of, and follow a sequence of actions to achieve a desired result. Fundamentally, this implies a social activity (Dourish, 2001: 57-58).

Lucy Suchman (1982) historically criticises the imperfections in HCI, in particular the emergence of cognitive models designed to predict social needs for the development of interactive computer technologies. These cognitive models are underpinned by the principle that human reasoning and action can be represented into the interactive components of ICT, thus creating an ICT that a user can effectively communicate with. Suchman presents two shortcomings of cognitive models: Firstly, the models ignore the circumstances that actions and behaviours emerge from, for the sake of accounting for the predicted cognitive action; Secondly, the models cannot foresee the context in which the actions of a user emerge, especially as human actions and behaviours are contingent in certain situations. Suchman advocates sociological and naturalistic studies to understand how people interact with technology (Heath et al., 2000; 302).

Increased sociological research investigating new ICT emphasises the fallibility of these technologies. Sociological inquiries into ICT especially highlight how new technology enthusiasts fail to acknowledge the effective integration of technology into social relations and social activities. Separation of the functional specifications of ICT from a complex of range of social relations cannot occur. For example, the physical designs of some technologies reflect the assumptions of manufacturers about the knowledge and capabilities of their users, which are often inaccurate and misguided (See Bruce, 1993:6). This is why there is increased sociological research into ICT innovation concerned with how people use ICT tools in a specific social environment (Heath et al., 2000:301-302).

Humans assign meaning to all physical objects (tree, table, etc.) they encounter. However, meaning making and interaction occur more intricately with ICT in terms of reading, writing and feedback in relation to the imagined reaction of others than when acting towards a table (Engesmo & Tjora, 2006:178). Consequently, the impact of humans interacting with one another through ICT is quite significant, which in turn influences face-to-face conversation. Blumer's second root image (1986:7) suggesting people consider each other during interaction, such as face-to-face conversation, applies to people communicating through ICT as well. Communicating through ICT affects how people change their actions and the way they interact based on how the receiver of the message will react. Symbolic interactionism highlights the importance of people considering one another when communicating through ICT. People apply the same considerations that they normally have during face-to-face interaction in an ICT communication environment.

Communication through ICT becomes more complex in comparison with face-to-face communication as respondents are not in each other's presence - they communicate across

time and space (McMillan, 2002). For example, people “watch their words” as they consider the impact the meaning (offensive, insulting, insensitive, etc.) of what they say might potentially have on someone else - assuming the communication medium is not video conferencing technology. In addition to people being considered when they are communicating through ICT, the adoption of Blumer’s three premises of symbolic interaction (1986:2) advance understanding of how people coordinate and collaborate to accomplish objectives using ICT, which is essential for understanding behaviour of ICT users (Aakhus et al., 2011).

2.3 Symbolic Interactionism and ICT adoption

2.3.1 ICT in education policy

The South African government considers ICT domestication and adoption in the TVET College and school sectors fundamental in addressing socio-economic challenges such as inequities, poverty, information sharing and educational development. To signal a fundamental shift from the country’s apartheid era, the National Department of Education (NDOE) introduced the national qualifications framework (NQF). NDOF introduced NQF as a new policy overhaul in the curriculum framework of the education system. In the country’s newfound democracy, the government considers NQF central in promoting the principles of equal access to education and economic prosperity (Isaacs, 2007: 2).

NDOE collaborated with the nine Provincial Departments of Education (PDOE) and the Department of Communication (DoC) in developing a series of ICT policies to address knowledge and social development through education. The DoC published a comprehensive whitepaper on e-Education, outlining the objectives in telecommunications, skills development and e-commerce that underpin ICT policies goals and priorities, as well as the critical role the TVET and schools sector plays in contributing to the development of the information society in South Africa (Van Zyl, 2013:50-51):

> Every South African learner in the general and Further Education and Training bands will be ICT capable (that is, use ICTs confidently and creatively to help develop the skills and knowledge they need to achieve personal goals and to be full participants in the global community) by 2013 (DoE, 2004:17).

It seems however, that policy goals have been overestimated. In 2010, only 10% of schools countrywide had access to computers. “The Department of Education certainly has set itself

a very ambitious task of getting each and every South African learner ready to interact meaningfully with ICT by 2013" (Pasensie, 2010:4). The slow implementation of ICTs in schools was mainly due to disparities between the nine provinces' economic strength. Progress was more evident in economically stronger provinces such as the Western Cape and Gauteng, with the implementation of reasonably successful ICT initiatives, including Khanya in 2001 and the Gauteng Online programme in 2002 (Brown, 2011:26).

In 2000, the WCED, in partnership with German based ICT companies and the German technical co-operation agency, initiated the DASSIE project. The aim of the project was to produce ICT knowledgeable lecturers, upgrade ICT infrastructure and improve ICT connectivity in TVET institutions. In 2003, the project was revised and refocused - with e-learning as a mode of academic delivery- on the National Certificate (Vocational) Education and Development (NCV) programs in TVET institutions. National government spent R1.9 billion (through the TVET college recapitalisation fund) on NCV (Theron, 2009:4).

In light of this, strong financial funding or lack thereof, makes the implementation of ICT policies in Higher Educational Institutions (HEI) a critical concern for government policy makers, educators and academic managers (Mkhize, 2011). Politicians and policy makers are often criticised for politicising ICT implementations with goals of eliminating socio-economic problems through massive funding in ICT development in HEI. The strategy is an impressive display of innovation that can create positive perception of government, but policy makers are ignorant of the wider social and cultural influences and meanings in an organisation that can impede ICT adoption (Selwyn, 2006:83-84; Somekh, 2007).

> It is not simply a matter of providing teacher educators with technology and the ability to use it with competence, nor does it involve simply supplying innovative projects and good examples at a pace that will keep up with the changes outside the educational context. It is not about making teaching and learning more efficient by retooling the context of teacher education, digitalising the traditional way of organising education. It could, rather, be regarded as a matter of "enabling cultural change in the profession..." (Granberg, 2011:13)

Despite the good intentions of government policymakers and their visions of improved learning and teaching through ICT (a view that most educators share), there are discrepancies about the meaning or goals of ICT implementation. Different perspectives emerge from these discrepancies that result in undesirable outcomes such as a low uptake of ICT amongst educators (Selwyn, 2006; Zara-Lee: 2011, 318). Policy makers should strive to establish a shared meaning between students, educators, management, IT support and technology suppliers (Bladergroen et al., 2012). Within the contextual basis of ICT

policymaking in South African education, the sections that follow highlights how the diverse symbolic meanings educators hold for ICT, affects adoption.

2.3.2 Domestication

The theoretical framework of domestication underscores the discussion of ICT adoption in South African higher education. The theory of domestication stems from the fields of anthropology, consumption studies, and media studies. The framework has been adapted to explore the context of people's experience with ICT, and addresses: (a) the meaning people ascribe to ICT, (b) the experience they have with ICT, (c) and the role ICT plays in their life. The process of domestication focuses on people's encounters with technology, and their decision to accept or reject ICT based on their encounters with digital technologies (Haddon, 2006). Although the framework primarily focus on the adoption of ICT by households or individuals, it can be used to study the organisational use of ICT such as the adoption of Learning Management Systems at a university (Habib, 2005) or the integration of ICT in teaching and learning at economically disadvantaged schools (Chigona et al., 2010).

Domestication comprises three main processes: (a) Commodification, (b) Appropriation and (c) Conversion. The *Commodification* phase highlights the technical features and brand identity of the ICT product that might fulfil a perceived need potential users have. *Appropriation* is the process a product goes through once people or an organisation implements it. Its potential adopters do not necessarily accept the product at this stage. In an educational context, the appropriation stage involves activities such as training and the incorporation ICT into the curriculum delivery. During the *Conversion* stage, the adopters accept, reject or negotiate the use of the new technology. They normally project their decision physically or symbolically to others (Chigona et al., 2010).

2.3.3 Symbolism and meaning

Many studies have investigated the educational values of ICT in South African HEI (Czerniewicz, 2005; Bladergroen et al., 2012). These studies found that ICT does not have educational value in itself, but it becomes valuable when teachers use it in the learning and teaching process (Kellner, 2000:247; Hismanoglu, 2012:185). Whilst ICT does not have internal meaning, it has the power to develop meaning. Meaning that arises is not static, but progresses and changes over time. "Socio-technical scripts" often describe the attitudes, and the values, that are associated with ICT products (Birkland, 2013:43). Educational policy

makers deploy socio-technical scripts to create meaning and need of the product for potential users (Heath et al., 2000).

Educational policymakers rationalise new ICT based on its technical capabilities such as ease of use, convenience, speed, and the like. They are generally unaware of the “symbolic power” of technology that affects the adoption process (see Selwyn, 2006). ICT acquires symbolic power during the process of interpretation by individuals or groups (Michalski, 2013). Symbolic power usually becomes prevailing through social interactions or the social representation ascribed to the ICT resource (Bladergroen et al., 2012). Granberg (2011) refers to symbolic power as “symbolic capital”; he infers that educators who hold such power, elicits it to influence perceptions in the organisational culture about learning approaches; consequently, it affects the outcome of the adoption process.

In addition to symbolic power, “symbolic support” affects the pursuit of successful ICT adoption in education (Lynch et al., 2003). Symbolic support refers to the values, attitude, and agendas educators perceive policymakers, managers and their colleagues to have, that reflect in the adoption process. Leadership therefore, is a factor that may have a pivotal effect on ICT implementation (Wong & Li, 2006:332). Opinion leaders, early adopters, or experts in the ICT field can influence the adoption decision taken by the other users. Their “opinions” reflect in the symbolic meanings the rest of the users attach to ICT (Lin, 2003:351-352). Additionally, symbolic support is generally evident in the assistance that educators knowledgeable in ICT provide to their colleagues lacking skills (Granberg, 2011:18).

These findings are consistent with a study by Bladergroen et al. (2012) that investigated the discourses of educators in under-resourced schools. The schools were part of the Khanya Project, an initiative created by the Western Cape Education Department (WCED) in 2001. The focus of the project was to improve learning and teaching through ICT (Theron, 2009:3). The Khanya project’s goal envisioned “every educator in every school of the Province … to use appropriate and available technology to deliver curriculum to each and every learner in the province" (Khanya, 2008).

Inadvertently deterministic attitudes emerged about the use of ICT during the project, which deterred educators from raising issues of concern for the fear of being “associated with ignorance and backwardness” (Brown, 2011:196). The educators expressed the following concerns: (a) they are under pressure to use ICT; (b) their lack of ICT knowledge results in a loss of confidence and helplessness; (c) older educators’ are frustrated with their limited ICT knowledge that lags vastly behind the knowledge of their younger counterparts; (d) inefficient

technical and policy support causing enormous frustration (Bladergroen et al., 2012). This chapter, underlined by the similarity of settings, judges the results of this study applicable and transferable to the social contexts of TVETs and/or HEI such as universities (see Van Zyl, 2013:81).

This section highlights that how multiple meanings emerge depending on the nature of symbolic support in an educational institution. Educators are appreciative of the efforts of government to develop ICT skills and in turn encourage self-empowerment. Educators do however feel disempowered because of insufficient support, which limits the full potential of ICT innovation (Bladergroen et al., 2012). The meanings ascribed to ICT influence their behaviour of adoption during implementation. If educators perceive ICT positively, it is a good indication of a possible successful implementation and adoption. Additionally, educators also ascribe meanings based on quality of training, technical support and exposure to ICT (Hismanoglu, 2012).

2.3.4 Institutional and cultural contexts

As mentioned, educational policymakers promote new ICT implementation based on instrumental benefits. Bruce (1993) label individuals and groups who believe that technology solely is responsible for improvements based on its technical capabilities as “technocentric”. ICT is seldom responsible for change on its own as technology has multiple meanings in different settings. A well-established social and traditional system in a higher education institution determines how educators understand and use ICT. Higher education institutions might have set pedagogic cultures wherein the educators are reluctant to change, and perceive innovation as a threat (Hennessy et al., 2005:7-8). Blumer’s second premise of symbolic interactionism, *social interaction,* addresses how the creation and maintenance of culture in an organisation is a predominant factor (LoConto & Jones-Pruett 2006: 82).

It can be difficult for educators to accept technological change, as it might prove challenging to mesh traditional beliefs and practices with conducts commonly associated with new technology (Bruce, 1993). Cultural, sociotechnical and socio-political settings shape the SCOT (social construction of technology) of educators, which in turn have a direct impact on the adoption, meaning, and diffusion of ICT in educational institutions.

> SCOT accounts of technology and emphasizes the overarching political, economic, cultural, and social imperatives of capitalist society which come to bear on any application of technology. By combining these critical and Critical Theory perspectives on technology, we

> can therefore set out a wide-ranging picture of the construction of higher education and ICT by a host of macro-, meso-, and microlevel actors which are often unseen in their influence (Selwyn, 2006: 85).

ICT implementation and adoption in education is a dynamic process. Policymakers should consider ICT as an addition to the institution's complex social system that always changes. Policymakers, institutional management and developers of ICT are often ignorant in what they idealise ICT should achieve. There is a gap between what they idealise for the use of ICT and what actually happens in practice once ICT implementation takes place. The ICT might not achieve desirable results, or if results are achieved it is not what the developers intended (Bruce, 1993:7). It is therefore crucial to investigate ICT phenomena in an institution from a symbolic interactionism viewpoint, as the emphasis falls on the rich occurrences that stems from interactions between ICT and its' users, as well as the institutional and social settings of such use.

Symbolic interactionism allows the emergence of indefinite research and clear discernment of findings if investigating complex multi-layered adoption patterns of ICT technologies (Prasad, 1993; Tan et al., 2013). Understanding the social and cultural influences in an institution facilitates the prediction, to an extent, of the meanings staff in organisations attaches to ICT. Moreover, monitoring interactions in the social system of an institution allow for early detection and the prevention of problems in ICT implementation (Fulk, 1993).

2.3.5 Roles and identity

Day to day personal, situational, and social settings forge educators' identities and roles. Identities in an organisation influence meanings associated with the use and adoption of ICTs (Rice & Leonard: 2012:11). For example, external pressures such as constant policy changes shape teacher identity negatively. Instead of massive funding, educational workshops, and teaching practices, the comprehension of teacher identity can improve educational practices (Smith and Fritz, 2008). Furthermore, people in leadership positions are influential as they play a head role, or embrace an identity that firmly embeds into an institution's social context. Employees normally embrace the attitudes and perceptions of the leaders. Therefore, a person with a leadership identity has significant influence on the adoption process and social construction of ICT (Gerth & Mills, 1953:117-118).

2.4 Photo-elicitation and symbolic interactionism

2.4.1 Method and study

Photo-elicitation refers to the use of photographs as a method, used in interviews to elicit hidden meanings it can hold for participants. Photo-elicitation has three main categories: auto driving, reflexive photography and photo voice. In an auto-driving interview, the interviewee is "driving" the interview by discussing the photos they have taken. Reflexive photography[5] involves the interviewer conducting a reflexive interview with the interviewees who reflect on the deeper and broader meanings of the photographs they have taken. Photo voice, also known as photo novella, involves the interviewees taking photographs that depict their everyday lives, and then discussing the meaning and significance of the experiences (Magnini, 2006:78; Hall et al., 2007; Parker, 2009:9; Zainuddin, 2009:11).

Some interactionists have used photographs as a methodology with the aim of eliciting meanings held by participants. This generally involves participants taking and interpreting pictures along a specific line of inquiry (e.g. the value of ICT in education). Photographs are meant to represent their social and real-life experiences. Additionally, the social act of taking pictures is itself useful to elicit otherwise concealed meanings and practices (Schwartz, 1989; Van Auken et al., 2010; Kamper & Steyn, 2011).

John Collier first proposed and published the photo-elicitation technique in a paper titled *Photography in anthropolog*y (Zainuddin, 2009:2). Collier was an inveterate ascendant of visual methodologies (Fanning, 2011:180) and his writings on photo-elicitation became influential reference points in the field of research (Parker, 2009:4). Collier collaborated with his brother Malcolm Collier to conduct extended experiments with photo-elicitation, which they describe and published in the book *Visual anthropology: Photography as a research Method* (Collier & Collier, 1986). The Colliers' conceptual theories and practices of photo-elicitation frame the discussions to follow.

[5] In this study, I use the reflexive photography photo-elicitation technique. The term "photo-elicitation" is used interchangeably with reflexive photography throughout this dissertation.

2.4.2 Methodological foundation(s)

Photo-elicitation driven interviews are a recommended technique for researchers who need to engage with strangers and people in a different cultural environment (Harper, 2002). The communication gaps between cultures narrow as photographs make unfamiliar and unpredictable subjects clear for both the interviewer and interviewee (Bignante, 2010:7). Photo-elicitation is also recommended (and serves the purpose of being a source of reference) for researchers attempting discovery of novice research areas. Understanding the literal content is always possible across and within new cultural, and power boundaries (Rose, 2001:3). The following statement by the Colliers sums up value of the photo-elicitation methodology:

> The technique photo interpretation by the subject of the photograph allows the ethnographic photographer to record and follow through scientifically themes such as the passage of a man through his culture...(and) it can become a meaningful and authentic part of the anthropologist's field notes, for when interview responses are studied against the photographs, overtones and circumstantial detail can be reevaluated and the full richness of photographic content can find a place in the data and literature of anthropology (1986:108).

The discussion to follow, assesses the following three primary benefits of photo-elicitation in more detail. In summary, photo-elicitation: (1) reduces differences in power, class, knowledge and culture between the investigator and the participant; (2) derives richer and more diverse information than other methods; (3) provides noticeable incentives for effectively uncovering the covert unconscious meanings of participants (Van Auken et al., 2010:373).

2.4.3 Meanings

To acquire understanding of the motivations and ideology of meaning construction projected through photos, a researcher needs to determine: (a) The circumstances under which a photo will be captured, (b) who will capture the photo and for what purpose and audience, (c) and if the researcher, the participant or someone else will control the content of the photo. Understanding these formative contexts can, and will, be crucial for both the researcher and participant in interpreting the meanings in photos (Parker, 2009). The researcher will acquire the motivations and ideologies through the research objectives, method of selecting participants, the specific photo-elicitation technique, and analysis of research findings.

Due to the inherent nature of the method, the informant needs to make the following preparations: firstly, they need contemplate what they will take a photo of, as well as why they want to take the photo; secondly, they need to perform the action of actually taking the photo. These pre-activities tend to feature a more informed participant who has the opportunity to create their own sense of meaning and reflect more profoundly on the meaning in the interview discussion. (Van Auken, 2010: 384). Furthermore, the meanings are therefore derivative of rich data since the participants usually capture photos of what they consider important (Zainuddin, 2009).

The activities the informant performed to capture a photo is captured in the photo itself. A photograph by nature then is an object of the past; therefore, it have the ability to "connect the past with the present" through the reinterpretation of meaning by the interviewee and researcher during a present interview. Through a verbal narrative, and underlined by the social context and environment of practices and beliefs, the participant reveals the meaning of the photo and thus gives the researcher an impression of what is was like to experience the event at that period (Parker, 2009). Therefore, meanings making occur (1) at the location the participant captured the image, (2) during the participant's interpretation of the image itself, and (3) during "audiencing" (Rose, 2001:32). The term audiencing refers to a particular audience (the interviewer and informant) that can reject, accept, or renegotiate the meaning of an image (Pink, 2000:186).

Photographs have "internal and external narratives"; the internal narrative referring to the photos' content and the external narrative is the social context from which the participant captured a photo. The social context is essential in understanding the meaning the image holds. The social context is a permanently embedded into the image – hence the referral "external narrative"- irrespective of when and where the image is viewed. Photographs are essentially a product of human action and are widely influenced by human relations. Hence, the need for a wider frame of analysis to understand the meaning i.e. making sense of the external narrative that allows for interpretation that is beyond the visual content of the image itself (Banks, 2001:11-12).

Photo-elicitation driven interviews are a "collaborative knowledge production" tool (Harper, 2002:23) in which, both the researcher and the informant engage in a complex set of activities that moves beyond the mere interpretation of meanings. For the interviewer, the discussion will move beyond the interpretation of meanings that the photographs hold i.e. Meta meanings such as the relation of photographs and the elicitation process to the

research agenda. The informant becomes more than a cultural object that blindly respond to questions driven by verbal probes or triggers that the photographs produce. Informants begin to anticipate the type of questions about the photograph and its wider meaning. They may have views of what the research is attempting to understand and undertake their own analysis (Jenkings et al., 2008).

The photographs do not only trigger meta meanings for the interviewer. Informants capture a wide of range photos that represent a broad range of meanings. This activity results in a discussion of countless areas related to their experience and their perceptions of the subject of inquiry. For example, with the photo of the recreational park in Figure 2, the photographer wants to highlight the park as a new important amenity for the community. In further discussion of the photo, multiple layers of meaning were uncovered. For the photographer – more important than the park itself for the community – was the collaborative social interaction, effort, and commitment of the community members working together to create the park (Van Auken et al., 2010: 378).

Figure 2: A product of communal efforts (Van Auken et al., 2010:379)

2.4.4 Power relations

With traditional sociology methods, there is a growing concern that power and knowledge is interchangeable in data production. Aspects that constitute power such as gender, class, and race influence the production of knowledge and information. Hence concerns in knowledge production questioning the validity and relevance of the produced data (Neal, 1970; Keller, 2005; Fourcade, 2010). Photo-elicitation distinguishes itself from many traditional research methods, and addresses the mentioned research concerns, as it effectively engages and empowers non-academic citizens. The photographs – chosen by the research subjects - visually express experiences, perspectives and social domains of the research subject. Simultaneously, it removes the *power barrier* as it "de-centres the authority of the researcher" (Van Auken et al., 2010: 374-375).

Photo-elicitation allows, "…people with little power or status to provide a narrative that highlights where injustice, inequality etc. have occurred and where change is possible" (Packard, 2009:7). Visual technologies in the past have only been refined to display a perverse perfection of "militarism, capitalism, colonialism, and male supremacy" (Haraway, 1991:188). These perfect visual displays distanced scrutiny from general society for the sake of maintaining unchallenged power. A photo-elicitation method such as reflexive photography empowers the normal person as it gives them the opportunity to highlight social injustice, and in turn promotes change (Hall et al., 2004). Consequently, it eliminates bias from the researcher or others as participants took the photographs themselves.

> Unlike the traditional methods where only the researchers handle artefact-producing devices such as cameras, a collaborative approach includes research methods that allow informants or participants to produce visual artefacts and representations of themselves (Singh, 2011:4).

The use of photographs in research is ideal for researchers who aim to empower, and reduce the power balance between themselves and their participants. (Wang & Pies, 2004:96; Packard, 2008:6). "Participant-led visual data production" that naturally occur in the absence of the researcher, reduces the intrusive presence of the researcher (Mannay, 2013). Subsequently power differentials are lowered between the researcher and the participant, resulting in the production of more social data that is ethical (Van Auken et al., 2010:384). Therefore, participants are empowered to be the authors of their own story, and project through images unique experiences that a researcher cannot experience (Burk, 2011:16)

Photo-elicitation techniques reduce power, but only to a degree. If a participant's knowledge proves limited about a process in the research, the power balance naturally shifts. For example, if a participant does not know how to operate a camera, and the researcher has to teach him, there is an immediate imbalance in power dynamics. This phenomenon places a different perspective on the link between power and knowledge. Figure 3 is indicative of a participant operating a camera the incorrect way if taking pictures, even though the participant initially indicated that he knows how to operate a camera. If a participant considers knowledge as a prime asset, they feel that admitting incompetency renders them powerless (See Packard's examination of homeless people in order to study the relationship between power and knowledge creation with photo-elicitation, 2008).

Figure 3: The finger in every photo highlights the participant's lack of proficiency operating a camera (Packard, 2009:17)

In instances where the researchers attempts to remove their "intrusive presence" from the visual data collection process, the power relationship is reconfigured as their intrusive presence is often replaced by the intrusive presence of significant others – friends, family, colleagues, etc. Researchers do not always adequately contemplate the power dynamics of the wider research relationships that restrict or dictate the visual and narrative of the data produced. For example, an adult sometimes misguidedly marginalises and silences the "voice" of a child by speaking for the child (Mannay: 2013, 136).

Figure 4: A parent's representation of his child's favourite pastimes (Mannay, 2013:140)

Figure 4 is a result of overt parental involvement in a research project where the child was the research subject. Instead of the child producing the images, the parent – utilising computer graphics software – created a collage of what he imagined his daughter's hobbies as being. Although the selection of images portrays the girl's preferences, the parental influence suggests control rather than collaboration. The collage signifies a lack of participant ownership and engagement, which deprive the interview process of an emotive basis for discussion. The parental influence diminished the girl's opportunity to narrate her experiences (Mannay, 2013:141).

2.4.5 Interviews with and without photographs

This theoretical comparison attempts to describe how some of the methodological tenets of the two methodologies, the photo-elicitation interview, and the classic verbal interview compare. To inform the comparison, this section will identify the following evaluative aspects and characteristics: (a) The differences between photo-elicitation driven interviews and normal interviews (b) The advancements photo-elicitation contribute to the interview process, data production, and evaluation (c) The limitations of photo-elicitation (Meo, 2010: 155).

Potential research subjects are less likely to refuse participation in a research project if the researcher asks them to take photos. The subject perceives taking photos as being less threatening than other methods (Van Auken et al., 2010). Normal interviews exhaust the memory if the interviewee needs to recall precise information. In contrast, interviews with photographs *sharpen* the memory and evoke realistic reconstruction of past information. Photographs act as a memory trigger as they allow the interviewee to capture former events. Normal interviews may hinder the free flow of information provided by the interviewee,

especially when probed for detailed information. Photographs on the contrary, lead to spontaneous expression (Harper, 2002:13; Loeffler, 2005:344, Parker, 2009:3).

Spontaneous responses can produce unexpected, rich, and different data in photo-elicitation interviews that the researcher might overlook through other research methodologies (Harper, 2002: Liebenberg, 2009:445). Rich data presents the researcher with the opportunity to explore and trigger multiple and deeper interpretations. Photographs do not only restore memory or initiate rich data filled responses, but can also result in a more relaxed informant than normal interviews. The photographs offer a detachment that prompts the participant to provide information more freely and in a relaxed manner (Bignante, 2010:15). Additionally, rather than focusing the attention on the participant (and placing him or her under the perceived pressure to answer), the photograph becomes the focus of attention.

Ideally, interviewers should conduct a pilot study and pre-interviews first to refine their semi-structured photo-elicitation interview techniques. It allows the interviewers to determine whether the questions prompt participants to respond with rich data, as well as how to ask questions while presenting a photograph to the respondent. Practice before the real interview presents the researcher with the opportunity to identify situations in the process where respondents react with confusion (Brand, 2008:47). A skilfully presented photo-elicitation interview deters the informant from moving off the subject of inquiry while answering the questions. If the informant moves off topic, presenting another photograph can bring the interview back into the field of study without verbal pressure (Collier & Collier, 1986:106).

Photo-elicitation is not without limitations. Photo-elicitation is time consuming before, during and after interview. Researchers need to resolve ethical issues, which are generally more complex with photo-elicitation techniques (In Chapter 3 a more detailed discussion will follow about the ethical factors associative with photo-elicitation). Before participants begin to take pictures, the researcher needs to brief them with guidelines of taking pictures that will best address the research agenda. During interviews, a researcher might face the challenge of eliciting information as some participants lack expression and articulation of some photos. This can mainly be ascribed to the perception of participants that some pictures *speak for themselves* i.e. they perceive that some of the images express the meaning by itself (Meo, 2010).

Practically, the photo-elicitation technique is generally more expensive, challenging, time consuming and demanding than traditional ones. Depending on the socio-economic environment of the participant, a researcher might need to buy cameras for the participants,

and pay for the development of the photos. Most researchers opt for disposable cameras, as they are low-priced in comparison with other types of cameras (Meo, 2010). In a socio-economic environment where participants are in possession of digital cameras and smartphones with integrated cameras, the photo-elicitation technique can be financially feasible for the researcher. The lowering cost of technological devices such as digital cameras and smart phones makes the option even more considerable (Packard: 2008:6).

2.5 Chapter summary

In summary, the literature in this chapter focused on theories, methodologies and methods that suggest eliciting and analysis of meanings ICT educators hold for ICT. Blumer's symbolic interactionism theory suggesting objects do not have intrinsic meaning, but meaning instead arises from social interactions (1986:12), is central to this literature review. This premise is consistent and reflects in the phenomena of ICT usage by educators and the photo-elicitation methodology. ICT does not have educational value in itself, but it becomes precious when engaging with it in the learning and teaching process (Kellner, 2000:247; Hismanoglu, 2012:185). A picture cannot convey meaning by itself, but only attains particular meaning if an observer verbally interprets it (Collier & Collier, 1986:129).

The literature proposes symbolic interactionism to approach holistically the interactions and meanings between ICT and educators. The literature makes it apparent that there are underlining societal conditions that encourage or impede the successful adoption in different social, cultural, identities and organisational context that always changes. Therefore, ICT implementation differs from institution to institution depending on these contexts. The literature suggests government policymakers and institutional management should heed these circumstances, and should by wary of "one-size-fits-all solutions" (Mlitwa, 2006). It is clear that there is a demand for transparency and social engagement during ICT adoption.

This chapter emphasised how photo-elicitation interviews discover images in productive ways to advance our understanding of people's social world and meanings. Although photo-elicitation is a creative method with a variation and decree of effectiveness, the literature highlights how challenging this method can become throughout fieldwork. There are no published literature that investigates the perceptions and attitudes of South Africa's TVET educators towards ICT as a teaching tool. A few research projects emphasise how the meanings educators have affects ICT adoption, researchers however conducted those projects in a university or school setting. This chapter identifies the prospect of reflexive photography to engage educators to deeper reflect on ICT as a teaching tool in the TVET

sector. The literature highlights the importance of research projects in the TVET sector, considering the challenges that remain in the government's ICT for education policy frameworks.

CHAPTER 3

3 Research design and methodology

The following chapter is organised into five sections: (1) the methodology and philosophical assumptions that frame the research; (2) Delineation; (3) the research setting and selection of participants; (4) data collection; (5) the ethical procedures implemented; and (6) data analysis.

3.1 Philosophical assumptions

In this section, I discuss the influence my philosophical assumptions as an interpretivist have on this study. The study departs from the interpretivist paradigm, with photo-elicitation methodology as a qualitative approach. Interpretivism allows me to adopt a subjective and interpretive perspective to analyse data inductively, and in so doing, gain in-depth understanding of participants' experiences and perceptions in their natural social environments. This design allows me to improve my understanding of the value that ICT holds for the TVET educator, i.e. what their interpretations of ICT are within their specific contexts. Bogdan and Biklen (2007:6) emphasise that in qualitative research, the interactionist does "NOT attempt to come to a consensus or seek to find a 'real' definition" but rather, he embraces the "ambiguity of the diverse meanings and seeks to study each one, and how they can simultaneously exist".

Within this paradigm, I obtained inside understanding of educators' various perspectives and experiences that construct shared meanings. Moreover, I considered educators to be co-creators and co-interpreters of those meanings. Therefore, the visual and verbal data that emerged from the techniques used in the photo-elicitation methodology, allowed the participants to collaborate in an interactive data collection process. Their verbal narratives and photographs provided a powerful frame of reference of their subjective beliefs and views of ICT. Thomas (2010:298) states that the interpretivist paradigm allows the researcher to:

> discover how people make sense of their social worlds in the natural setting by means of daily routines, conversations and writings while interacting with others around them. These writings could be text and visual pictures.

I am aware that I cannot fully understand the meanings held by educators. Furthermore, I acknowledge that as a TVET educator myself, my worldview i.e. my academic background

and present academic environment) subjectively influences the research inquiry. Subsequently, it shapes the interpretation and construction of shared meanings. Loots (2011: 75) cautions against subjective feelings and ideas that are exhibitive of the interpretivist paradigm. Researchers should constantly be aware of the factors that influence knowledge construction. To address this challenge, Watt (2007) recommends that the interpretivist apply guidelines of reflection by compiling a reflective journal. Reflexivity entails the researcher learning how to reflect on one's thoughts about the social phenomenon under study and understanding how one's behaviour may affect the inquiry. With this in mind, I documented my personal opinions and feelings in a research journal during the research process. The following excerpt from my journal is representative of my subjective perspective:

My position as a TVET lecturer in IT vs. my position as a researcher in the IT sector of TVET

For me computer technology comes easy. I adapt relatively "effectively" to ICT for commercial and academic use. Perhaps my background as an IT student and IT lecturer, as well as my interest in the IT field is the reason why I find it so easy to embrace computer technology. I am always surprised with friends, family and colleagues' attitude towards computer technologies. I am sometimes irritated if they struggle with technology that I perceive as easy to understand or operate. I am equally annoyed if people are not impressed with technology, especially if I perceive the technology to be incredible. When I started with this research project and reading literature addressing ICT adoption, I discovered how selfishly biased I was with my perceptions and opinions of other people's attitudes towards ICT. I realised not everyone has to embrace computer technology. I further realised that I cannot expect other people to embrace technology to the same extent that I do. I have realised that I must attempt to filter the perceptions and experiences of my participants through my own views and outlooks of ICT (Research journal, 1 November 2013).

Additionally, Loots (2011:136) warns about the *pitfalls* that can result due to differences in the researcher and participants' culture and background. The author asks the following question, "Is it possible to fully and truly understand and interpret the participants' views, keeping in mind that I come from a different background, culture and sometimes portray views that differ from those of the participants in the current study?". To address this challenge, Alma and Smaling (2006:195) suggest that an extensive degree of "empathic understanding" is required from the researcher. The authors propose the following definition for empathic understanding:

> Empathic understanding is understanding another person based on empathy; this understanding is directed at comprehending or explaining the experiences, mental states and behaviour of that person, also in the interrelationships.

Throughout the data collection and interview process, I strived to adopt the participants' point of view to understand their thoughts and experiences. This excerpt from my journal illustrates my reflections about the matter:

My thoughts after the Interview I had with Emilia

I sometimes find it difficult to understand how people struggle with certain computer technologies. During my interview with Emilia, she revealed how she struggles with certain software programs and hardware devices, as well as tasks that she must do on the computer. In hindsight, it used to be my personal opinion that no one should struggle with some of the things she mentioned, because it was just easy for me to do or work with. It was interesting to see another lecturer's view of ICT – which I consider easy to understand and do - as challenging and complex. I realised that not all lecturers have the IT knowledge and background I have. I have to *put myself in their shoes* if I want to understand their views of ICT (Research Journal, 17 March 2014)

3.2 Delineation

This research study is confined to the meanings that ICT holds for educators at two TVET Institutions in the Cape metropole of the Western Cape Province. Findings may not be generalised outside the particular population from which I selected the sample, due to the unique and small sample size. Nonetheless, the settings involved in this study, permit the results to be transferable within the social contexts of other South African TVET institutions. Rodon and Sesé (2008:1) present two premises for transferability of qualitative research: (1) if mutual phenomena characterises the social setting, the setting may be commensurable; (2) The exchangeability of research results depends on the match between mutual phenomena of the settings.

Tsolo (2006) conducted a similar study in the Gauteng Province and investigated the implementation and utilisation of ICT and E-Learning in public TVET colleges. Given the similarity of settings and findings between this study and Tsolo's study, one can deduce that the research results of these two studies are transferrable across TVET institutions in South Africa. Moreover, if one considers that of the country's 9 provinces, Gauteng and the

Western Cape, in addition to KwaZulu-Natal, employ the highest number of educators in the Public TVET sector (Department of Higher Education and Training, 2011:16), it is reasonable to conclude that these views and experiences might be representative of those held by TVET educators across other provinces (See Table 2).

Provinces	Estimated number of TVET educators	%
Gauteng	2074	24%
Kwazulu Natal	1854	21%
Western Cape	1231	14%
Eastern Cape	1109	13%
Limpopo	865	10%
Free State	575	7%
North West	426	5%
Mpumalanga	401	5%
Northern Cape	151	2%
Total	**8686**	**100%**

Table 2: Number of educators employed across South Africa's nine provinces (Department of Higher Education and Training, 2011:16)

Both this research and the study conducted by Tsolo have the following aspects (among others) in common in respect of ICT adoption in TVET institutions:

- Both studies draw from TVET policy documents published by the government.
- Both studies report similar challenges that hinder successful ICT implementation in FET such as unreached objectives set in government policies, the digital divide, lack of infrastructure and connectivity in institutions, the lack of ICT knowledge and skills among educators, and limited access to digital technology for students.

3.3 Settings and participants

Two TVET institutions (TVET1 and TVET2, pseudonyms to ensure anonymity) in the Cape Town metropole partook in this study. Initiated by the DHET, the TVET institutions are a result of a merger of several individual public colleges. A common organisational structure was adopted after the merger, with each Institution consisting of a Head Office, with each of the previously separate colleges serving as Campuses. These TVET institutions employ

numerous educators across the campuses, teaching a diverse number of qualifications in a variety of different course offerings. Amidst the growth of the TVET sector, both institutions initiated ICT programmes in an effort to improve both communication, and the quality of education across the various campuses. ICT as a form of communication, storage, and learning systems has been crucial to ensure these Institutions are successfully standardised and centralised.

Purposive sampling was the chosen non-probability technique to select participants from the TVET institutions. Permission was initially sought from the CEO's of the respective Institutions and my research proposal was presented to them. Thereafter, the academic heads and members of management discussed the proposal at the respective college management meetings. Once approval was granted, each CEO sent out an electronic invitation to all staff, outlining the details of my proposed research, and inviting willing participants to the study. Eight lecturers from TVET1 and four lecturers from TVET2 volunteered to partake in the study. Each participant was presented with an envelope containing: (1) The participant information letter (Appendix A), (2) A consent form (Appendix B), (3) Business card sized consent cards (Appendix C), and (4) Business card sized information cards (Appendix D). The sections to follow discuss the above-mentioned documentation.

3.4 Ethical considerations

To address the ethical factors related to the photo-elicitation technique, the study follows the guidelines and directions of a sub division of the British Sociological Association- the Visual Sociological Study Group. The Visual Sociological Study Group (2006:1) bases these guidelines on the *Statement of Ethical Practice for the British Sociological Association*. The aim of the guidelines is to create awareness and give guidance with respect to ethical factors in sociological research employing visual methodologies. The guidelines do not suggest core methods to address ethical issues, but rather stimulate ethical practice and reflection of the professional position of the researcher, especially with regard to the participants that are affected by the activities of the photo-elicitation methodology. Therefore, I considered these guidelines in the context of photo-elicitation as a method for this project.

The participants were briefed about the principal ethical considerations, such as assurance of physical safety, informed consent, voluntary participation, anonymity and confidentiality. As a consequence, the identities of participants will not be revealed, unless with their explicit consent. I used pseudonyms in place of the actual names of people. All visual material will

be handled confidentially and for academic dissemination purposes only. All 'non-selected' material (that I discard in the data filtering process), will be destroyed or handed back to the participant. The data will not be published on any commercial platform, nor will any associated royalties or fees be sought.

In photo-elicitation projects, researchers need to consider obtaining different levels of consent. Researchers must not only ethically consider participants, but likewise third parties i.e. people that are not directly involved in the project that appears in the photos (Davies, 2008). Therefore, participants were asked to seek consent from a person (third party) if a scenario were to come forth where they wished to photograph the person (and the things the person owns). Participants presented third parties with a consent card (Appendix C) which the third party signed. Additionally, participants presented the third party with an information card (Appendix D) in case they wanted to know the purpose and objectives of the project.

During a briefing session, a question arose regarding consent required for a photograph taken of a group of people in a public arena. The argument was that it is not practical to obtain consent of every person within a large group. The solution given was that in such an instance the identities of the people in such photographs could be altered to render individuals unidentifiable. To address this type of hypothetical situation, Wiles et al. (2008:22-23) suggests that visual researchers can blur the identities of individuals in images by pixilating or altering the facial features. In an interview session, a participant had a photo (figure 5) she thought was of importance to the research project. She was not able to obtain consent from any person in the picture. To use the photo in my research, I used photo-editing software to render the identities of the individuals unidentifiable.

Figure 5: Individuals anonymised.

3.5 Data collection

Before interviewing the participants, I observed scenarios wherein the participants used ICT as learning and teaching tool. I conducted a pilot study and pre-interviews to refine the photo-elicitation technique. According to Brand (2008:47), a pilot study allows the interviewers to: (a) determine whether the questions prompt participants to respond with rich data; (b) learn how to ask questions while presenting a photograph to the respondent; (b) identify situations in the process where respondents react with confusion. Once I established the initial groundwork, the data collection process consisted of three stages:

Stage 1: Briefing

The briefing session involved a verbal explanation of the project agenda as specified in the participant information letter (Appendix A), the photo-elicitation technique, and the ethical factors. Although encouragement was provided about the direction that participants can take when capturing the photos, I ensured them that they can take any image (within ethical boundaries) to drive the responses in the subsequent interviews. Smith (2008:50) recommends that the interviewer provide hypothetical scenarios to provide guidance to the participants. I provided the follow hypothetical scenario (an excerpt from my research journal):

Hypothetical scenario that may encourage a participant to take a picture

If a participant takes a picture of a fast car, for example: a Ferrari, the picture of the Ferrari might represent the speed of ICT for that participant. If a participant takes a picture of a car with a flat tyre, it might represent the frustrations caused by disconnected ICT due to technical or uncontrollable factors (Research Journal, 20 November 2013)

Stage 2: Individual photography

According to Van Auken et al. (2010:373), photo-elicitation enables a researcher to better understand “the interplay between people and their natural and build environments”. All my participants captured photos in their workplace or in their social life. I noticed two distinctive aspects from the photos captured. Firstly, two educators who lecture in the Travel and Tourism department of their respective institutions- Emilia (TVET1) and Cleopatra (TVET2)

captured photos on their “travels” during the December 2013 holidays (See Figures 6). It is noticeable that these photos reflect their field of academic interest.

Figure 6: Emilia and Cleopatra’s traveling photos

Secondly, I noticed a pattern in the photos captured by Desdemona (TVET2) and Viola (TVET1). Desdemona deployed her students as active participants in several of her photos, which reinforced her primary discourse; the technological shortcomings in respect of her students’ experience at the TVET institution. Desdemona underscored this discourse with the following statement: “If you look carefully at my photos, it is not about me as a lecturer… It is about students that do not have access to technology to work” (see Figure 7). I also noticed a pattern in a collection of photos provided by Viola (TVET1) - see Figure 8. The photo is a visual narrative of a destroyed carpet in her home that she later replaced with a neat laminated floor. This photo pattern is a central theme in her symbolic narrative of struggles and triumphs she experiences with technology.

Figure 7: The ICT experience and needs of Desdemona's students

Figure 8: Viola's destroyed carpet and new laminated floor

Stage 3: Elicitation

I conducted one-on-one photo-elicitation interviews privately with the participants in a quiet, vacant lecturing room at the participating TVET institutions. I first copied the photos from the device (digital camera or smart phone) the participant used, to my laptop. Thereafter the interview commenced wherein I presented a photograph on the laptop screen and asked questions with reflective prompts. The same reflective questioning prompts were included for all the photos to trigger emancipatory, broad, and rich responses from the informants. Brand (2008:50) acknowledges that reflective guiding questions have the potential to facilitate maximum probing around specific research objectives. At my own discretion, I altered the wording in the questions where necessary and asked more questions to encourage further explanation and clarity. Appendix E is a sample of one of the interviews I conducted.

With the participants' permission, using a voice recorder application on my smart phone, all interviews were recorded. All data (photos, voice recordings and field notes) was stored using cloud computing and only I have access this data. If a scenario arises requiring me to share the data in future with other researchers, consent will first have to be sort from the participants.

3.6 Data analysis

Thematic analysis is the technique selected to analyse and interpret the data. Fereday and Muir-Cochrane (2006:82) describe thematic analysis as "a form of pattern recognition within the data, where emerging themes become the categories for analysis". This chapter frames thematic analyses within Schutz's (1967) social phenomenology, an interpretive theory that explores the subjective meaning of an individual's experiences. According to Schultz, subjective viewpoints need protection against the bounded rationality and biases of the researcher. This research project will align the data analysis process with the six stages proposed by Fereday and Muir-Cochrane in their adoption of Schutz's theory. The six-stage process involves deductive thematic analysis while using an inductive coding method that allows themes to emerge from the data:

- **Stage 1- Develop a code manual and develop descriptive themes:** To create the code manual I identified (a) code names, (b) definitions of a code's theme, and (c) descriptions to identify a theme if it emerges. See table 3 as an example:

Code	Definition	Description
Label 1: Appreciation	Educators appreciate technology that is functioning effectively, and subsequently contribute to improvements in teaching and learning.	Educators appreciate the flexibility ICT adds to teaching and learning methods.
Label 2: Frustration	Educators are frustrated with their inability to understand ICT and lack of support.	If educators struggle to finish a task using ICT, it affects academic delivery negatively. Conditions worsen if they do not receive sufficient support to resolve problems.

Table 3: An example of codes developed from the data I collected

- **Stage 2- Test the integrity of the code:** The evaluation of themes is vital to ensure that the themes are representative of all the data (Alhojailan, 2012). As a test piece, I selected data from in-depth interviews taken in a study by Bladergroen et al. (2012), investigating primary school educator discourses around the use of ICT. I created a code manual from the respondents' answers and compared it with the predetermined code template; no modifications to the original template were required. Table 4 is an example of applying the codes to interview data to a previous study.

Theory-driven code	Participants' response from the Bladergroen et al. (2012) study
Appreciation	"The teacher benefits but the learners also benefit. The teacher saves much of his time, because if you look for information on the Internet it does not take much time. The whole community and South Africa because we are exposing our learners at primary school already there will become a computer literacy at primary level so the nation will benefit from them. One day they will be parents and coach their children. So the whole world will benefit from this ICT." Bladergroen et al. (2012: 112)
Frustration	"Yes you know, not being able to fix a problem like if the screen freezes so now what do you do? Those little things. Not knowing enough to be able to fix things yourself, now you have to call - 'please come and look at this'." Bladergroen et al. (2012: 113)

Table 4: An example of applying the codes to interview data of the Bladergroen et al. (2012) study

- **Stage 3- Encapsulate data and identify initial themes:** I read the field notes I made, listened to interview recordings and summarised raw data with the aim of identifying potential themes (Thomas & Harden: 2008:10-11). In Table 5, I provide an example.

Research Question	Summary of responses
How do you use ICT generally as a teaching and learning tool?	▪ Use data projector to present lessons in PowerPoint ▪ Prepare lessons ▪ Ask students do use Internet to do research ▪ Do administrative task ▪ "I use it rarely"
How do you associate this photo with ICT as a teaching tool?	Responses varied depending on the photo that was the focus of discussion.
What are you feeling or thinking now if you look at this photo?	▪ Frustration ▪ Unhappy ▪ "My feeling is that we are behind" ▪ "I am grateful" ▪ Convenience and frustration ▪ Happy ▪ "Mixed emotions" ▪ Shortcomings ▪ Clever ▪ Organised ▪ "I learn everyday" ▪ More practice is needing ▪ Inefficient support ▪ "It gives you wings"
Do you think other educators are experiencing these emotions as well?	▪ Yes. ▪ "Fear of the unknown"
Do you think the role-players responsible for ICT implementations are addressing the challenges associated for ICT properly?	▪ "Get the money! Make plans! Budget for it!" ▪ Give proper training with written instruction manuals.

Table 5: An example of participants' responses summarised under question prompts

- **Stage 4- Apply the codes:** I aligned the codes from the code manual with the transcribed data in order to deduce meaningful data. In Table 6, I illustrate how I coded the data by matching the codes with segments of data that describes the theme: *Appreciation*.

Participants	Description
Emilia (TVET1)	"Although I do not understand the mechanical processes of a computer, I appreciate the value computers provide. I associate the value of computer with wheat, a final product that the windmill produces."
Ophelia (TVET1)	"It makes me feel very happy, very satisfied with technology because I don't think anyone's education should be hindered by disability."

Table 6: An example of code 1 "Appreciation" applied to participant responses

- **Stage 5- Link the codes and identify themes:** I applied codes from the code manual to identify meaningful correlations between texts. The identified themes underpin the researcher and participant's interpretations of the data. Themes I identified, I clustered under headings that directly relate to my research questions. See Table 7:

Code	Symbolic meanings	Influence on adoption
Frustration	Educators view ICT as a valuable and useful tool, but they are frustrated with their incapability to understand it fully. According to them, they need to practice if they want to improve computer knowledge and skills.	Lack of computer skills and knowledge makes the process slower
Insufficient support	Educators recognise the value and convenience ICT can add to teaching and learning. However, there is limited availability of ICT in their institutions.	Educators will attempt to embrace technology if it becomes available in their institution, or if existing technology is upgraded as it is supposed to be.

Table 7: Linking the codes and grouping identified themes under headings related to the research questions

- **Stage 6- Corroborate and authenticate coded themes:** Finally, from the grouped themes, core themes (second-order themes) emerged (Table 8). The core themes capture the symbolism of ICT that manifests in the raw data. I ground the validity of the raw data, which transpires into the formulation of reliable themes, from a "theoretical thematic analysis" approach (Braun & Clark, 2006:12). Theoretical thematic analysis emanates from a researcher's theoretical interest into the research inquiry. Braun and Clark infers that researchers who adopt this form of analysis, tend to focus on themes identified in past research. Hence my attempt to test and match the integrity of the code at "Stage 2" above with the participant data from the Bladergroen et al.(2012) study.

  I further ensured reliability by applying thematic analysis at a "latent level" (Braun & Clark, 2006:13). At a latent level, analysis moves beyond the explicit meaning of data; the researcher instead meticulously examines the broader meanings that are entrenched in participants underlying notions and beliefs. These meanings are embedded in their symbolic narratives. For example, the excerpts, "I am grateful" and "It gives you wings" from the summary of participant responses in Table 4, underscore and allude to the value and satisfaction technology provides in education. As recommended by Fereday & Muir-Cochrane (2006:90), I assigned the "distinct phrase" *Appreciation* to accurately describe these meanings and assumptions that underpin the theme. To ensure rigour, I reread the participants' response to verify that the data matches and correlates with the three primary themes: *Appreciation*, *Frustration* and *Perseverance*.

  As part of the refinement, Braun and Clark (2006:22) suggest the researcher identify "sub-themes". I identified two sub-themes under the *Appreciation* theme: *Support* and *Structure, order and creativity*. Under the *Frustration* theme, I identified two subthemes: *Lack of Knowledge* and *Limited Support*. Although no sub-themes were identified under the *Perseverance* theme, I consider aspects relating to educator's personal and professional advancement interchangeable and centre to this theme. Braun and Clark recommend that researchers recognise sub-themes with the aim of providing structure to a large theme and establish the "hierarchy of meaning within the data" (ibid).

First order themes	Clustered themes	Core themes with sub-themes
Although educators do not always understand how computers function, they appreciate the value, satisfaction and convenience ICT contributes to teaching and learning. They are frustrated with their inability to understand ICT fully, and lack of support that are associated with it. According to them, they are aware that they need to practice if they want to improve computer knowledge and skills. Additionally, they want better-quality support from ICT policy makers and institutional management to improve their ICT experience.	*Theme 1- Appreciation*: Although educators do not understand the technical functionalities of ICT, they are aware of the benefits and appreciate the value and structure ICT adds to teaching and learning.	Appreciation ▪ Support ▪ Structure, order and creativity
	Theme 2- Frustration: Educators are frustrated with their own inability to grasp technology. Additionally, educators want individuals who are managing ICT implementation, to improve financial and technical support.	Frustration ▪ Lack of knowledge ▪ Limited Support
	Theme 3- Perseverance:	Perseverance (Personal and professional growth)

Table 8: An example of corroborating and authenticating coded themes to identify second-order theme

3.7 Summary

In summary, the purpose of this chapter was to present the research design and methodology underpinning this study. This study employed interpretivism as a research paradigm, and photo-elicitation methodology as primary means for collecting data. Informed by past research (Bogdan & Biklin, 2007; Thomas, 2010; Loots, 2011), I extent and attempt to make sense of the interpretivist paradigm in the opening of this chapter. Researcher subjectivity and reflection was an argument central in the interpretivism discussion. Subjective and self-reflexivity enables a researcher to better understand the participant's experience and natural world. In this study, participants' expressed and projected their natural environment through visual data. This ultimately allowed me to make sense of

educators' interpretation of digital technology as a learning and teaching tool from their own use and experience.

In Chapter 1, I provided a brief overview of delineation and ethical considerations- this chapter provides a detailed discussion on these areas. I provided more background regarding the TVET institutions where participants teach. I also explained the processes I implemented to select participants using the purposeful sampling technique. Further, I provided an overview of the data collection process which involved three stages: briefing, individual photography, and elicitation. I conclude this chapter with an extensive analysis of the themes extracted from participants' visual data. I draw from comprehensive thematic analysis studies conducted by Schutz (1967), Braun and Clark (2006), Fereday and Muir-Cochrane (2006), and Thomas and Harden (2008) to engage this undertaking with rigor. I found Thomas Braun and Clarks' (2006) "theoretical thematic analysis" to be especially useful in ensuring the validity, reliability and refinement of the themes that emerged.

CHAPTER 4

4 Findings and discussion

This chapter discusses the findings from the qualitative data analysis, which includes the themes and subthemes that emerged from the photo-elicitation interviews. The chapter is organised into four sections. The first section describes educator user types and usages of ICT as learning and teaching tool. The following three sections will discuss each of the three dominant themes that the educators expressed during their interviews: (a) appreciation, (b) frustration and (c) perseverance.

I structured and contextualised this chapter according to the research questions posed in Chapter 1. The research questions therefore are connected to the research inquiry. I formulated the research questions as follow: What are the multiple symbolic meanings in TVET that educators associate with ICT? Additionally, how do these symbolic meanings affect the adoption of ICT by TVET educators? The concepts of ICT, TVET educators, meaning, and interpretation are embedded in the research questions. In terms of these concepts, I will examine the three themes that emerged. The core discussion of themes will centre on the interpretations of meaning.

Meaning objects have for humans, originates from social interaction with other people or objects (Blumer, 1969:2). “Objects” refers to technology that TVET educators use for teaching and learning purposes. “Other people” may refer to co-lecturers, educational leaders, policymakers or students. If educators discuss among each other the *likes* and *dislikes* about educational ICT, they engage in “social interaction”. Likewise, if an educator uses ICT as a tool to impart knowledge to students, they engage in “social interaction” with the ICT tool. Moreover, the ICT tool is part of the social interaction between the educator and students. Therefore, educators construct “meaning” of technology through social interaction.

The reciprocal meanings that emerged from participant narratives are discussed in the forthcoming sections. Blumer (1969:17-19) notes that mutual meanings are common in a community. Commonalities in meanings may merit the universal understanding of digital technologies in education: professional development of teachers, effective support tool for teachers, alternative learning options, innovation in research, and so forth. Blumer nonetheless cautions that constant interpretation of meanings can invoke an array of opposing thoughts, symbolisms and perspectives. I intend to discuss this multifaceted nature of meaning in this chapter.

4.1 ICT user types

At the beginning of each interview, I questioned the participants about their general use of ICT in teaching and learning. I considered it important to first establish the participants' "user types" (Birkland, 2013:118) before exploring the interpretations and meanings through photo-elicitation. This endeavour allowed me to determine educator "identity" in relation to the use of ICTs. Blumer (1969:14) suggests that a person is a holder of an identity. The implication is that a person engages in self-indication, by creating an object of what he or she notes. The person then assigns meaning to the object, which in turn directs his or her actions based on the meaning. Establishing educator identify in relation to ICT will allow me to better understand the meanings they assign to ICTs, which in turn may shed light on the extent to which they adopt digital technologies.

Birkland categorises ICT users by five user types: "Enthusiasts", "Pragmatists", "Socializers", "Traditionalists" and "Guardians" (see Table 9). Birkland's research sample encompasses people that purchase ICT for commercial use. I have confidence that in contextualising the user types within the educational use of ICT, I can add meaning and value to the research inquiry. Desdemona is the only participant that fits the Socialisers type, whilst the findings suggest Viola is the only Traditionalist. I will discuss Viola as a Traditionalist in the next section. The rest of the participants fit the description of Pragmatists. The correspondence below between Emilia and myself is the most accurate representation of the Pragmatists ICT user type:

> "I feel about technology, like my one colleague said, a computer is like a recipe book; there is a big variety, but you only use what is applicable to you and what fits your lifestyle…what you need. You do not have to feel that you need something because you do not know how everything works…you do not need everything." (Emilia, TVET1)

Researcher: So you only have a need for the basics of technology and do not feel that you need, miss out, or have any desire to know how the more advance features of technology work?

> "Only the things I need I want to know. I want to be able to use it efficiently, but I do not have any need or desire to use the more advance features." (Emilia, TVET1)

Type	Description	Formative Experience with ICTs	Other Defining Traits
Enthusiasts	Love ICT and are fascinated by it. Early adopters. They are frustrated with ICT, but are willing to experiment and want to do thing on their own.	User was exposed to technology early (young age). Self-led learner.	Are up-to-date about new forms of technology, which they learn through friends, family, work, publications, etc.
Pragmatists	Consider ICT only as a tool necessary to complete a task. The decision to use a new ICT depends its usefulness.	User was exposed to technology early in job career. Occasional exposure to mechanical side of technology as a child.	Tend to be fairly knowledgeable about technology.
Socialisers	View ICT as a vital form of communication. They want to learn about new technologies.	Often have positive experience with ICT at work.	Have large multigenerational social networks and are deeply involved in their communities.
Traditionalists	Will adapt to newer forms of ICT if proven they add something additional beyond the older form.	Tend to have had an extreme positive or negative experience with ICT.	Tend to be surrounded by individuals who are technically capable and rely heavily on them.
Guardians	Guardians do not tend to view ICTs as negative in themselves, but are very concerned that they allow individuals wallow in the negative traits.	Tend to have had an extreme negative experience with ICT.	Have a mistrust of ICTs and most modern media.

Table 9: Description of the Five User Types, their perspectives, formative experiences, and other defining traits (adapted from Birkland, 2013:119)

Figure 9: Desdemona – "No Interactive Social Media Pages for Direct Public???"

> We all know that everyone is on Facebook. It is such an effective way to communicate with students, but what happens at our Marketing Department of the college? It frustrates me. Is it not supposed to be their main goal? If you go and look how you are supposed to talk to the public or your target market, then you should go and look at the tool they use. Social media is currently the best method to communicate with people. We do not do it. Again, we receive an email with an instruction, "Can all lectures please tell the students…" I have enough work! Why do we not use a method that we know will enable us to reach the parent or student directly? That was our feeling about this. Especially me, I am extremely focused on information; people needs to know things. If you know things, you can become an effective employee. So for me it as a big frustration, that there is nowhere that the students and parents can go to view, for example, a timetable or calendar for the week that announce, "That afternoon netball practice will take place, "That day is student parliament", "Take notice we close Friday an hour earlier, there will be a power outage." It is almost as if our students is falling through the cracks, because we cannot get to all of them.

According to Birkland (2013:119), Socialisers view "ICT as a vital form of communication". Figure 9 and response above indicates that Desdemona exhibits characteristics of a Socialiser. She believes that social media platforms- with particular reference to Facebook- is the best method to make important announcements to students. Birkland states that Socialisers "are deeply involved in their communities". At the start of the interview, I asked Desdemona to provide a brief overview of her duties as a TVET2 educator. She responded that she prepares her students to become knowledgeable in their academic field, and to

become mature adults. “I will often throw some life lessons into my academic teachings” (Desdemona, TVET2).

This affirms the deepening extend of her involvement and interest in her students. Her response particularly suggests that her scrutiny into shortcomings of communication to students is to their best interest. Socialisers ask the following general question about ICT, “does it connect me to others (younger generations)?” (Birkland, 2013:119). Desdemona’s expression, “We all know that everyone is on Facebook”, certainly answers the question. On perusal of the photos Desdemona produced of her students (See Figure 7), one can reasonably assume the students range between the ages of 16 and 21, which classify them as “younger generations”. In her academic environment, Desdemona have the characteristics of a Socialiser, but cannot apply “Socialiser actions” to better the academic experience of her students. This frustrates her. She believes the responsibility lies with the marketing department to investigate social media platforms as means of communication. She is frustrated that they do not investigate the communication capabilities and possibilities of social media.

None of my direct participants fit the Enthusiasts or Guardians user types. I can however provide accounts of these two user types that fit educators at the TVET institution I lecture. I base these accounts on my observation of interactions concerning technology that occurred between fellow TVET educators, and my own experiences. I believe observations and reflexivity I report of the two user types in the education context is valuable to the research inquiry, and I additionally deem it necessary “fieldwork” (Whitehead, 2005). Whitehead considers fieldwork a pivotal form of inquiry into social group meanings while conducting research. It is his belief that “total immersion”, which involves direct observation and interaction within a social group, allowing researchers to advance understanding of local meaning (2005:3-6). My profession as a department head and TVET lecturer allows me to spend most part of my day observing and interacting with fellow TVET educators about technological issues. I made short entries into my personal dairy of what I observed, and thereafter documented the experiences coherently in my research journal:

IT lecturers versus non-IT lecturers' perception of ICT

Titania is an Entrepreneurship lecturer and participant in the research study. She shares an office with four other business studies lecturers. Titania occasionally comes to our office (the IT office) with her laptop to sit and work. She works in the IT office because the printer is nearby; the printer is their office is broken, so the IT support technicians configured their laptops and PCs to print to the IT office while they resolve the issue. On the occasions they print, they have to walk approximately 50 meters from their office to the IT office to fetch a printout. This frustrates them extremely. Titania explains another reason why it is better to come and work in the IT office is because "IT gurus" that can quickly help her if she has an "IT problem" surround her. Titania makes use of the opportunity because she always asks an IT lecturer, Tom, to help her if she has a problem on her laptop or with her smartphone. Tom is always enthusiastic to assist her, especially if it comes to explaining how a function on her Samsung Galaxy S4 works. Titania always "praises" Tom on this IT knowledge and skills. Today Titania was upset that she was not able to print. She asked Tom for help. Tom discovered her laptop's WIFI connection was not active and switched it on. Titania seemed upset with herself for not realising the problem, "I forget to switch the WIFI on every single time. My brain just does not work like yours". Today's events and the interaction between Tom and Titania made me realised again the vast contrast of perceptions of ICT between IT and non-IT lecturers (Research Journal, 16 April 2014).

Challenging the technological imperative

Today the Programme Managers of the various courses attended a demonstration of an electronic timetable software program offered by an external software production company. I was impressed with the clever coding and practicality embedded in the software's programming. After careful analyses of the demonstration I deduced that the program could eliminate the complications (such as clashes, unallocated lecturing halls, etc.) we currently experience with our traditional "timetable system". The problems are normally resolved only once classes commence. My subjective and somewhat deterministic belief is that most, if not all of the problems we experience presently with timetables can be resolved with this electronic timetable program. However, not all of my colleagues shared this sentiment after the demonstration. It was clear that some refused to see the beneficial aspects of the program and their responses had negative connotations. My personal belief and observation is that previously unpleasant experiences with introduced ICT solutions have made these educators wary of new initiatives. I also noticed that although educators use current software

programs, they only use it because they have to. They do not hide their dislike; every opportunity they get they raise their concerns and unhappiness with certain ICTs (Research Journal, 24 April 2014)

From the 16 April 2014 entry, I deduced that Tom is an Enthusiasts user type. Based on my personal observations of Tom I noticed how easily he adapts to, and incorporates various forms of ICT into his lessons. I suppose it is hardly surprising since he is an IT lecturer and he teaches IT subjects. From the 24 April 2014 entry, I also inferred that educators resisting the idea of an electronic timetable are Guardian user types. Although they do not view ICT negatively, they "wallow in the negative traits" and "have a mistrust in ICT" based on "negative experience(s)" (Birkland, 2013:19).

I have provided a *glimpse* of the multifaceted thoughts, views and symbolisms of digital technology in the TVET educator environment. This grounds the approach of understanding the intellectual puzzle. It is in the followings sections: *the general use of ICT in education* and *emerging themes*, that I address the research gap rigorously. I will engage theories of symbolic interactionism with empirical data and analysis to reveal and interpret meanings.

4.2 The general use of ICT in education

"…human beings act toward things on the basis of the meanings that things have for them" Blumer (1969:2).

According to the participants, they mostly use data projectors in collaboration with Microsoft PowerPoint and the Internet browser to present lessons to the students. Additionally, they instruct students to use the Internet to do research on given topics. Wong and Li (2006:330) determined by means of a statistical *t-test* that Internet and presentation software is the most commonly used ICT tools for learning. These findings were consistent among educators from both TVET institutions. Secondary purposes of using ICT include performing administrative tasks such as record keeping, student attendance, making announcements to students, etc. In context of the opening quotation, educators' engagement with PowerPoint, Internet access, data projector is meaningful, which suggest that educators adopt with certainty to these software applications and hardware devices.

> We are very lucky that each classroom in which we teach has a computer and a data projector. You can - if you want to - do PowerPoint and you have access to the Internet. While you teach, you can show the students something on Google Images, which is nice. We also have had access to YouTube for the past two months as a trial, which is nice.

> Because of our course subjects, we really had a need to show the students things on the Internet. Everything was initially blocked; you just had access to a few things. They opened it for a trail period; it is nice, we can show YouTube videos, which really helps a lot (Cleopatra, TVET2)

> Well, especially being an IT lecturer, we use many ICT methods. There are computers in the classroom. We use the overhead projector to better display information to the students, to be able to see when explaining work. A lot of different research is done. We allow the students to conduct their own research to understand subjects better (Ophelia, TVET1)

> I use the computer and the data projector to present lessons that I prepared at home. Every day before a class starts, I use the super register that is on the system to complete the student absenteeism- the students also sign class list as a backup system (Hermia, TVET2).

Participants expressed "universal" views and understanding of digital technology, in particular reference to their use of the Internet (Brown, 2011): "It is almost like approaching the vast world of technology" (Cleopatra, TVET2); "With Internet access, the world is so much closer" (Hermia, TVET2). Van Zyl (2013: 131) is intrigued by this universal reference of technology and the Internet and asks, "What then, is this other world; does it stand in opposition to the existing social world [people] inhabit? Can it help explain and define local technology encounters?" This universal view ties in closely with the *digital divide* concept, which is a dominant educator discourse in the *Limited support* theme (discussed in Section 4.5.2).

Only one participant, Viola, reported that she "rarely" uses ICT for teaching. She attributes her minimal use due to a shortage of data projectors and her inability to operate a data projector. She furthermore attributes her minimal use of the data projector to power interruptions that occur at her campus. Reverting to Blumer in the opening quotation, one can clearly deduce that data projectors have no significant positive meaning at all for Viola. Power interruptions and her lack in skill operating it; renders the device useless to her. As noted earlier, Viola seems to fit the Traditionalists user type (see Table 9). Her response in the passage below is consistent with the characteristics of Traditionalists.

> I use it rarely. There is not enough data projectors; there is just 3 classes that have data projectors. We regularly have power outages - you use the traditional white board and a tru-projector. I type the notes on the computer and then I make transparencies. 90% of the time the tru-projectors do not work. I never use the data projectors because I do not know how to operate it (Viola, TVET1)

It is clear from the passage that Viola points out her own personal ICT experience. She does however use the pronoun “you” (Brown, 2011:120) once in solidarity with other educators to indicate they experience the same frustration, and in light thereof exercise similar actions. By using this specific rhetoric, she exhibits what symbolic interactionists describe as “role-taking emotion” (Fields, 2006:158). Through role-taking emotion, and using the pronoun “you” instead of “I”, she reinforce her feeling of solidarity and believe that others in her social group share her views and actions. Viola embraced the “generalised other”, that is, the particular expectations a person believe others in the social group attach to actions and identities (Mead, 1934).

Unexpectedly, another participant (Ophelia, TVET1) also mentioned the inconvenient effects of “power interruptions” on ICT practice. In her response, I find it interesting the effect of an external “non-academic” occurrence such as power interruptions on the use of ICT. Ophelia’s passage below is a representation of how the power interruptions by the South African Electricity Supply Commission (Eskom), as well as her institutions inability to manage the inconvenience following power interruptions, hinder the use of ICT. South Africa’s public electricity utility Eskom applies power interruptions known as “load-shedding” to certain areas when there is not enough electricity available to meet the demand of all their clients (Eskom, 2014).

> In South Africa, there is Eskom, which we all know is unreliable. There should have been put in generators many years ago, for when the students…especially in the IT department, we all work on computers. (sic) When Eskom decides to cut the power then all the students have no work to do. They have no technology to work on. It is extremely frustrating; there should be generators in place for things like this, especially for an IT campus that does not have generators to power the IT part of it (Ophelia, TVET1)

Eskom’s load-shedding is implemented on a macro scale, but clearly has implications on the micro level of educators’ technological encounters. Educators will certainly assign meanings with negative connotations to ICT. Consequently, this also pertains to the digital divide. The South African government’s strategy of narrowing the narrow the divide is to implement technology access programmes in education with the aim of improving ICT literacy among educators and lecturers. Shortage of electricity to power ICT devices, and power interruptions may undoubtedly hamper the government’s strategy if not addressed urgently. In light of the aforementioned, should the digital divide not be conceptualised broader? Currently technological *haves* and *have-nots* define the digital divide; but what about the effect external factors such as the electrical power supply of a country have on ICT provision?

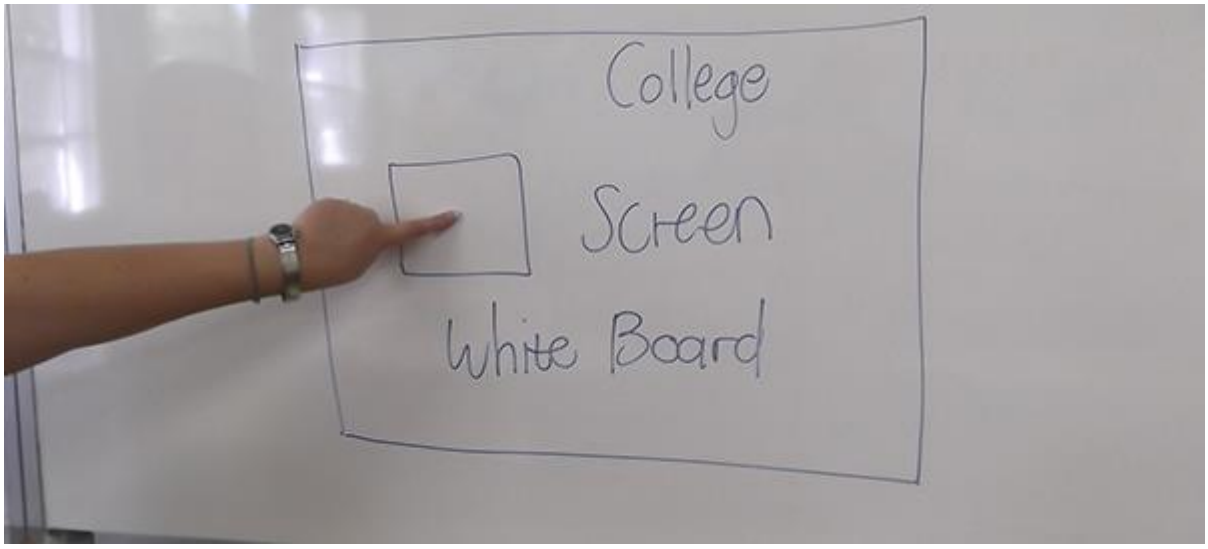

Figure 10: Desdemona's technology "want" and "dream" for her classroom

> It is a funny photo in terms of where I touch it with my finger, actually means touch screen. What I actually want to show you; I drew a touch screen on my normal whiteboard. That is what I want in my class. This is a dream for my class, to have an interactive touch screen white board. I want to use it to move photos around, write with a pen on it and wipe it. It is nice to use the normal white boards, but it is not linked to Internet, to windows. It is not a frustration about technology; it is a dream about technology that I would like to see in my classroom. It will allow us to work better, to become more effective. I can ask my students to get up and work on the board. We should not only lecture; we should allow the students to participate in the class. They should not just sit there because they fall asleep. We should let them get up; they should be involved in the lesson. I think a screen like this would be fantastic in my classroom. This is what this photo projects, my IT dream.

Figure 10 is the only photograph of the research study that hints at "pedagogical intervention" from an educator with the use of digital technology aiming to refocus teaching and learning conceptually from a teacher-centred approach to a student-centred approach (Wong & Li, 2006:319): "…it is a dream about technology that I would like to see in my classroom… I can ask my students to get up and work on the board. We should not only lecture; we should allow the students to participate in the class." (Desdemona, TVET2). This process of refocus is impeded by obstacles such as negative views about ICT, reactions to technology determinism, lack of institutional support, and lack of ICT skills (Granberg, 2011:12). I discuss these impediments in more detail in Section 4.5.

Desdemona's drawing of an interacting whiteboard, and enactment of operating one, resonates with Blumer's *fifth root image*, the *nature of human action* (1969:15). "That is what

I actually want in my class"- This expression, coupled with her sketching "action" encapsulates Blumer's inference that the formulation of human action consists of humans forging a line of conduct based on interpretation. This conduct "covers matters as his wishes and wants". To further reinforce and consolidate the veracity of this practical and theoretical comparison, Desdemona's expression "This is a dream for my class" points towards Blumer assertion that conduct of action forms are confined "to an inner life of reverie".

4.3 Emerging themes

The three core themes are identified and summarised in Figure 11. These themes reflect experiences, beliefs and views of ICT that TVET educators expressed through photographs. Following qualitative data analyses of participants' data, no new themes emerged as data saturation occurred.

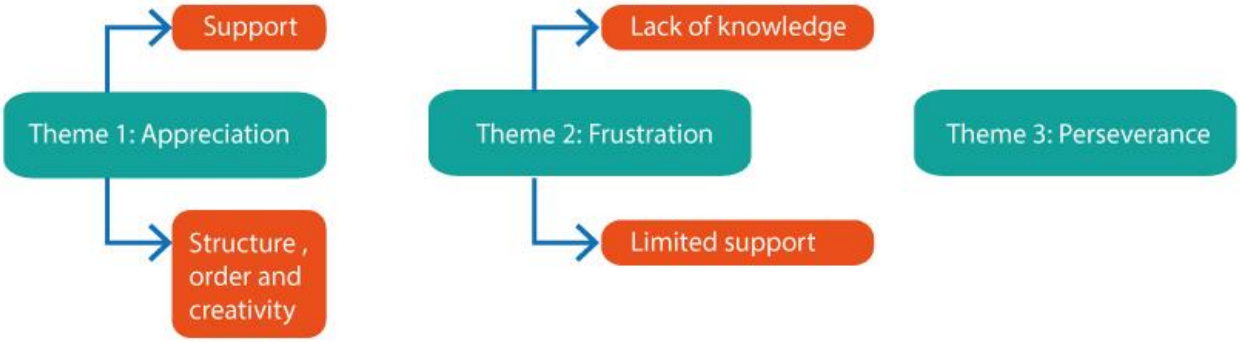

Figure 11: A thematic map of the main and sub-themes

4.4 Appreciation

The educators reported diversification of their positive experiences and interactions with ICT. Educators from TVET1 and TVET2 share a sentiment of appreciation for the availability of ICT in their institution, and agree that it is and needed asset. Many studies (Czerniewicz & Brown, 2005; Mlitwa, 2006; Isaacs, 2007; Jaffer et al., 2007; Bladergroen et al., 2012) affirm the consensus among South African academia that ICT- regardless of the numerous challenges- is a valuable and productive asset in education. The educators from this research project feel "satisfied", "grateful" and "good" about the "value", "convenience", "order", and "cleverness" ICT adds to teaching and learning. Two aspects of appreciation was evident in the data: (a) the additional ICT support available for educators that results in improved teaching methods; and (b) the structural and ordered enhancements the technical functionalities ICT adds to teaching practices. Figures 11 to 17 below provide accounts of

educators' appreciation, exploring the underlying aspects of support and structure that ICT provides.

4.4.1 Support

ICT "nourishes" and "it gives you wings". Educators allude to the reliable support that ICT is capable of providing. Educators in general, view ICT as useful "supporting material" (Van Zyl, 2013:132). Available ICT tools assist educators in simplifying their work and raise the level of quality in education. Educators believe that ICT tools improve efficiency and enhance effectiveness in academic delivery. They also seem to think that pedagogical practices cannot effectively function without the support that ICT can provide: "without it everything around it will basically just die" (Ophelia, TVET1). Educators also seek the assistance, and are grateful for support from computer literate colleagues if they struggle with ICT (see Figure 12). Assistance or the lack thereof by ICT knowledgeable individuals influences the adoption decision taken by users in need of assistance. The nature of the support they receive reflects in the symbolic meanings the rest of the ICT users attach to it (Lin, 2003:351-352).

Figure 12: Ophelia – "Making the world a better place"

> Well, just like a waterfall that nourishes the earth…without it everything around it will basically just die. This is how I feel about IT in an education environment. It has really created so much value in education; nourishing it, making it grow, giving us new and better

ways to educate learners. I think it definitely brought a higher level to education. (Ophelia, TVET1)

"…without it everything around it will basically just die" (Figure 11). This utterance fortifies the symbolic power ICT has for some educators, and perhaps the foothold of the technological imperative prevalent in education. Within a symbolic interactionism rationale, Michalski (2013:3-4) notes that symbolic status of this powerful nature, are influential in negotiating perception and meaning of technology. This powerful status is fortified by Ophelia's position as an ICT lecturer at her institution. Moreover, Ophelia's identity as a Practicalist ICT user type permits her to assume and reflect the "role" and behaviour expected of Pragmatists, and to express and share rhetoric of techno optimism (Burke, 2005). Ophelia is the only ICT lecturer that participates in this study, but Burke would argue that her meanings of ICT characterisation are shared among ICT lecturers (2005:2). Van Zyl (2013:148) cautions however, that symbolism vary among individuals and within a community, and advocates the observation of "multiple symbolisms" in the local context.

Figure 13: Cleopatra-"Value 2"

This photo I took in December when I was on holiday in Wilderness. When I looked at the photo again I realised the value of computers in our work, because the moment you walk in here until you leave you are busy with computers. I thought, "It gives you wings". The symbolism is that it makes you fly. You can just do your work so much more effectively. If

you can type out assignments and tests on the computer, store it - it is accessible the next year. So it is about the value, and it gives you wings (Cleopatra, TVET2)

"It gives you wings" and "the symbolism is that it makes you fly" (Figure12). These utterances suggest that metaphorically ICT represents professional empowerment. ICT empower by information production, sustainable development, transfer of information and progress. Lakoff and Johnson (2008) observe that people often represent their thoughts and experiences with metaphors. Further, in a historic study, Hennestad (1987 cited in Prasad, 1993) suggested, "computers and their systems also play a role as metaphor and source of ideas". By citing Hennestad, Prasad (1993:1402) underpins the belief that symbolic perspective go beyond explaining ICT in terms of technical and economic advancement, but allow explanation about people's representations of ICT, which in turn influence their interactions with technology.

Figure 14: Support and caught-net if something goes wrong

"If you master something on the computer, then you feel so good. You are on cloud seven, you are proud of yourself. Then again, a computer can bring you back to earth quickly if you struggle again. If I go to another program- the basis stays the same- but the functionalities is different. You are then very frustrated; you are back to struggling and have to start again. If you look at this photo, it is steel cables. If you are not a computer lecturer, you depend so much on the computer literate lecturers because they are specialist. The caught-net is also

there, it helps if you use a computer. You are not that scared. If something goes wrong, you can ask the computer lecturers." (Hermia, TVET2)

The photos and responses of Figures 13 and 14 indicates that ICT support and assistance provided to educators, causes them to endure in their difficulties with technology and fortify the value they perceive ICT to have. Blumer's third premise of symbolic interactionism holds that a person undergoes an interpretive process in which meanings are dealt with or altered during social interaction (1969:2). By interpreting the supportive actions of ICT knowledgeable colleagues, Hermia and Cleopatra symbolically ascribe positive meaning and connotations to their technological experience. Further, Blumer's *second root image* namely *the nature of social interaction* (1969:7), is an example of Hermia's technological encounter. Blumer explains that people take each other's actions and behaviour into account during social interaction, thereafter they change or re-examine they own behaviour. Hermia's feelings of frustrations with technology change to feelings of optimism after encountering the supportive actions of others.

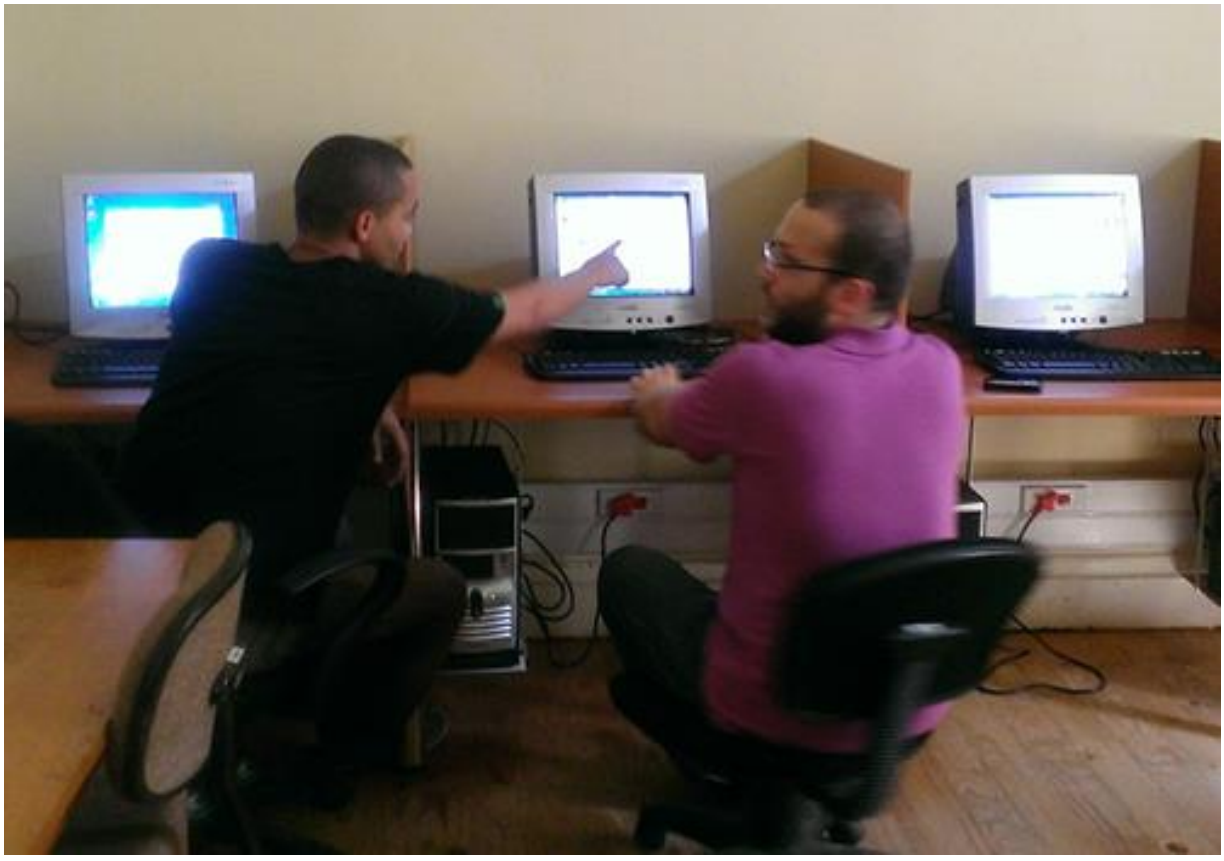

Figure 15: Cleopatra- "Conve"

They are our two…whatever you call them…that is Iago and his assistant Demetrius. The idea behind taking this picture; it is nice to have 2 people on our campus that you can phone

quickly and say, “Listen here, I try to do this but it doesn’t work” or “Listen here this thing’s cables are not connected come quickly”. Therefore, the two of them for me represent “*convenience”* because they are close and it is easy to get a hold of them.

4.4.2 Structure, order and creativity

Although educators do not fully understand the technical functionalities of ICT, they appreciate and are impressed with the improved structure and order it adds to their teaching methods. Figures 15, 16 and 17 below represent one of many understandings of this aspect: “Although I do not understand the mechanical processes, I appreciate the value computers provide” (Emilia, TVET2. Furthermore, educators value the creativity associated with the technical functionalities: “It definitely accommodates an element of a person’s creativity and not only the technical aspect. You can also be very creative with your computer, not only sterile and neat.” (Emilia, TVET2). Van Zyl (2013:55) notes that teaching and learning for educators and learners can advance through the “creative application” of technology. Van Zyl postulates that teachers take advantage of the efficiency of ICT, by embracing creative problem-solving and self-directed learning models.

Figure 16: Emilia-“the mechanical aspect”

The aspect of power. In this specific instance, water powers the windmill. Although I do not understand the mechanical processes of a computer, I appreciate the value computers provide. I associate the value of computer with wheat, a final product that the windmill produces (Emilia, TVET1)

Figure 17: Emilia- the creative aspect of ICT

It is a handmade clay tile. What is important for me is the process in creating such a beautiful elegant final product. I do not know what the creator have done to get it like this, but the final product is striking. To in extent this is simple and it is the situation with a computer. The most basic aspect of a computer, if I understand it correctly, is 1's and 0's, which is actually simple but also results in big art or a striking final product. I appreciate computer processes that occur in the background and that you can create a good final product if you know what to do.

Researcher: So although you do not understand all the processes of a computer, but you argue if a person knows how to work with a computer it can be effective for them.

Yes, I realise that one can do helpful and impressive things with it. This is how I see this tile; it is very beautiful. I do not know how the creator got it like this; I have no knowledge of pottery. The glassier things they put on, I do not know how they make it. I know it is

handmade; I do not know how they get the lines and patterns so neat, but the final product is very profoundly beautiful.

I deduce from Emilia and Viola's responses that they create identity-relevant meanings of ICT that correspond with the identity standard of the educator community. Burke (2005) defines this process as "identity verification" in symbolic interactionism, that is, "people act to verify or confirm their identities, and in so doing, they bring about a situation in which relevant (perceived) meanings are consistent with their identity standard". Viola's expression (Figure 17), "I think a computer is supposed to sort like that" suggest appropriate "role behaviour" and therefore affirms Burke's theory.

An aspect of "identity standard" reflects in the following expression of Emilia: "Although I do not understand the mechanical processes of a computer, I appreciate the value computers provide". Burke explains that role players ascribe particular meanings to maintain certain conditions, by projecting particular behaviour. The goal is the desired outcome, despite unpredictability. In spite of not knowing how the hardware works that powers a computer, Emilia is still interested in the "final product" it can deliver. Burke believes that meanings in this instance goes beyond mere symbolism; meanings become a goal they aim to achieve.

Figure 18: Viola- "sorted"

This was at a wine cellar. They make wine in that 150 litre wine barrels. It gives a beautiful impression, it is stainless steel. It is beautiful and it is sorted. I think a computer is suppose to sort like that. That is how I want to feel but I do not have that knowledge to sort it (Viola, TVET1)

4.5 Frustration

Two aspects of the “Frustration” theme emerged from the interview transcripts: (a) lack of knowledge and (b) limited support. Studies I referred to earlier in this dialogue, highlight aspects of ICT which translate into improved educational outcomes and also notes the numerous challenges that stem from it (Czerniewicz & Brown, 2005; Mlitwa, 2006; Isaacs, 2007; Jaffer et al., 2007; Bladergroen et al., 2012). Phrases expressed by the participants such as “struggle”, “angry”, “stuck”, “behind” and “unhappy” represents the challenges TVET educators encounter with ICT. Bladergroen et al. (2012:116) advises ICT implementers to be aware of the “sources” of discontent among educators, which will allow them to determine the reasons for the low uptake of technology.

4.5.1 Lack of knowledge

The passages below suggest that that the educators feel disempowered and fearful of their inability to be fully proficient with technology. Figure 18, and the corresponding participant’s response, accounts for the deterministic *status quo* that expects educators to instil training using digital technology, and educators’ inability to act as expected of them (Bladergroen et al., 2012:114), as they are “fearful of what is on the other end” of an ICT adoption “path”. The responses associated with Figures 19 and 20 signify the educators’ conceptual “tug-of-war” between their desire to impart knowledge with the aid of ICT tools, and their limited ICT knowledge. Bayne and Ross (2011:159) refer to educators who project these confounded ICT attitudes and views, as “immigrants”. The authors construct their disposition from the “native-immigrant opposition” evident in popular culture. From each opposition (native versus immigrant), they extract terminologies and characteristics from academic literature, which cluster around each primary opposition (Van Zyl, 2013:136).

Figure 19: Ophelia-"Fear"

> I think there are students, IT lecturers… (as well as)…. non-IT lecturers…(who when faced with)…. a new technology... (approach it)… with a lot of fear instead of… quickly, or as quickly as they should. So this path is just…you know you don't know where you are going. You are fearful of what is on the other end. This is the same with technology, especially in the education environment, you get a new way to project your information and then you sit around being really scared thinking, "oh if something goes wrong, how do I fix it? How am I supposed to help the students now?" It creates a lot of fear.

Immigrant characteristics such as "slow", "old" and "knowledge" Bayne and Ross (2011:161) are consistent with the following phrases expressed by participants: "I come out of an *era* when there were no computers when I studied" (Hermia, TVET2); "…because my knowledge is so limited, it results in me taking longer…" (Emilia, TVET1). Direct opposite terminologies that characterise a "native" ICT user ("fast", "young" and "digital"), are also evident in the following excerpts of a participants' response: "If you think about it, the students are more clued up then us with the computer. They quickly show me what I should do" (Hermia, TVET2); "The challenges is more, the quality of the route I follow is lacking because I do not have the knowledge that you have for instance." (Emilia, TVET1). The participants' excerpts illustrate the belief that young people naturally embrace digital technology, whilst older people struggle to adapt and be proficient in ICT.

Figure 20: Emilia's representation of her limited ICT knowledge

> This is the board on Swartberg pass that is the turn off too what is generally known as "The Hell". It is a small remote town between Oudtshoorn and Prins Albert, where people lived for years in isolation. It is an extremely poor road; you can just about attempt it with a good 4 x 4 vehicle. This is how I feel sometimes - You see the distance is 37km and you think that one normally drives that distance in 15 minutes or less, depending on the road and the driving conditions. If you further notice that it has a travelling time of two hours, then that is how it feels I am working on a computer. Someone like you looks at the 37 and think that it is 15 minutes maximum, but I look at this task and think, "bliksim, it is 2 hours!". My car and the conditions that I function under, due to my limited knowledge, results in me taking longer to complete this distance. The challenges are more, the quality of the route I follow is lacking because I do not have the knowledge that you have for instance. In my situation specifically, my limited knowledge is a symbolism of the 37km that takes 2 Hours to drive (Emilia, TVET1)

The similarities of symbolism between the photos of Ophelia (Figure 18) and Emilia (Figure 19) are striking. Both images are representative of the ICT adoption process, which they view as a difficult journey with many challenges on the "route" or "path" toward technology proficiency. I believe the difficult path/route theme highlights the contrast of ICT adoption

between Enthusiasts who readily adopt technology and Pragmatists such as Ophelia and Emilia who need to overcome quite a few challenges before they become proficient in ICT.

Figure 21: Hermia- "tug-of-war"

> Sometimes when I want to present a lesson to the students, the computer for some or other reason does not want to work. Then I feel that I am in a tug-of-war with this machine that needs to work so that I can impart my lesson successfully to the students. It is also an illustration of my feelings with computers in general; I come out of an era when there were no computers when I studied. I taught myself with certain programs to understand how a computer works. If you think about it, the students are more clued up then us with the computer. They quickly show me what I should do (Hermia, TVET2)

Hermia's expression, "…the computer for some or other reason does not want to work. Then I feel that I am in a tug-of-war with this machine that needs to work…" points to an unconventional tenet of symbolic interactionism, namely "anthropomorphism" (Prasad, 1993; Waytz et al., 2014). This concept, as explain earlier, refers to people treating technology humanlike, by placing human confidence in technology to assist them in performing a task. Prasad provides an example of a participant that is *angry* with a computer that malfunctioned- the participant wanted to know why the technology is making so many "stupid" mistakes. The participant thus ascribed an attribute ("stupid") associated with humans to a non-human entity. Hermia has trust in technology to improve her teaching abilities, but it disappoints her by *breaking* her trust when it does not function as expected.

Waytz and co-authors describes “trust” as a multifaceted concept that refers to the belief that another will act with integrity and competence (2014:3).

The authors predict that increased trust in technology is resultant of increased deniability by a person for their responsibility in an undesirable outcome. Although Ophelia does not explicitly blame technology for hindering her lesson, she still places a significant amount of responsibility in technology to aid the successful presentation of a lesson. The loss of confidence in educational ICT forecasts undesirable adoption outcomes, especially since people increasingly encounter technology on a personal and intimate level. Waytz et al. (2014:12) additionally notes how technology changes the way people interact with their social world. Technology is no longer only a “mindless tool”. For example, people ask (in the literal sense of the word) their smartphones to give them driving directions, recommend restaurants, and so forth.

This example certainly places focus on the extent to which technology can be anthropomorphised with humanlike attributes. Computer assisted instruction (CAI) e-learning software that presents multimedia lessons in the form of animation with corresponding verbal explanations (Mayer, 2003:300), can certainly incur symbolic realities of anthropomorphism. In a study that investigated *The implementation of e-Learning in Public Technical Vocational Education and Training Institutions in South Africa*, Tsholo (2006) discovered that e-learning in general is a little known phenomenon in TVET institutions. Has there been a change in this phenomenon since 2006? If it is a well established and used learning alternative in other types of academic facilities, what significance does educators’ anthropomorphisation of CAI e-learning have on teaching and learning? Can it contribute to understanding technological encounters in education?

In conclusion, the symbolic narratives of “limited knowledge” in the context of Blumer’s first premise of symbolic interactionism, indicates that educators ascribe meanings of proficient technology skills to social objects such as young people and ICT lecturers. Further, educators ascribe meaning of technological incapability to an “abstract” object (Blumer, 1986:10); referring to their feelings of helplessness if they on certain occasions engage with technology and the outcome is undesirable. Finally, the symbolism of anthropomorphism is still a rare phenomenon presently, but it might perhaps become a more prominent facet affecting ICT adoption.

4.5.2 Limited support

The overall feeling among educators is that the government and institutional policy makers are not supporting them sufficiently in their struggles to utilise ICT. They believe there is substantial loss of progress due the government and their institution's inability to provide proper financial support for ICT innovation. Certain responses highlighted below, such as "I do not want to read in a newspaper that a minister drives a R3 million Mercedes" and words used, such as "greed", suggests that the participants believe funding might be misplaced. One participant further attributes the lack of ICT support to illiteracy among policymakers. Akinsola et al. (2005:33) considers (among other factors), "low literacy rates", "high cost of equipment/software" and "bureaucracy in dealing with ICT matters" as risks affecting ICT provision in South African education. Although participants admit, "keeping technology up to date does get expensive", they insist however that this explanation is "not good enough" and that implementers need to "make plans". The responses below highlight this view:

> "I think that is the biggest problem- a shortage of funding- but get the money! I do not want to go into politics, but *I do not want to read in a newspaper that a minister drives in a R3 million Mercedes, but my students do not have a place to go and work*. Get the money! Make plans! Budget for it! I perhaps talk too easily because I am sitting here, I do not work with the available finances. Make it a priority! We say, "Come study...come study...come study at our college!" The student just has a classroom, a toilet and a cafeteria that is not even a cafeteria. Where must this kid work? Where should he do his research? Where should he print? We want them to get out of this gap of "previously disadvantaged", but it is not as if there is more advantage here - they have a classroom, a lawn, and a semi cafeteria. It is not good enough. In my opinion, it is just not good enough. The students deserve better. Thank you for the classroom, thank you for the chairs, and thank you for the air con…I am thankful, but it is not good enough. We cannot expect them to go out and work, and know how Excel, Pastel, Word, a fax machine, (and) a computer work, but they cannot touch it physically where they studied. Funding is probably a problem, but if you want something to work, then you make it work. I just think that the focus it not strongly enough on it. I think if the focus was more on it, if it was an urgent need in TVET colleges, then you will see a big change in the way money is spent."(Desdemona, TVET2)

> "Well, you can't do much if you are not educated properly. Therefore, I definitely think that is a big factor. And greed! They are not interested in bettering the lives of people other than their own. So, they are uneducated and greedy. They will never…not in this country, not for many decades will we be able to further ourselves with technology." (Ophelia, TVET1).

“We want them to get out of this gap of “previously disadvantaged”, but it is not as if there is more advantage here” (Desdemona, TVET2). This quote reflects findings suggesting that the National Department of Education were overly ambitious in their goals to: (a) get each South African learner to meaningfully interact with ICT by 2013 (Pasensie, 2012;4) and; (b) abolish economic inequities - the legacy of a politically repressive system- by establishing South Africa as part of the global information society (Van Zyl, 2013:43). It frustrates educators that TVET institutions are not part of the global information society. This is evident in their frustration with the unavailability of new technologies at their campus, they believe are adopted by other educational. The technologies they refer to are WIFI technology, online student registration (Figure 21), limited Internet access (Figure 22), and hardware/software updates.

Figure 22: Desdemona-“No Electronic Registration???”

> “For me it was frustrating. The college conducts registrations for years, and I feel at the universities and at many other places it already happens or they are busy considering the option. It feels that we are not moving forward. Therefore, it is a frustration with non-advancing technology. Do they investigate this? Do they try to make it easier for both the student and lecturer? When I spoke to her (woman pictured above) about this I asked her, “What bothers you when you think about technology? How can we make it better?” She

answered, “Mam, we have to do it electronically” What she felt I placed on paper, and you can actually she from her facial expression. Look how frustrated she looks. I think I had the same feeling. It is difficult for us to be at a station 5 days long without a computer, and to help parents’ complete forms. I have work to do (Desdemona, TVET2).

Figure 23: Cleopatra- "In TVET only starting"

The photo is amazing, but it feels at TVET colleges we are sitting on that little white benches and we are looking out over this vast big world out there in terms of the ocean. It feels to me, with the Internet that is now open, we started looking at what is out there. We can now see this beautiful ocean. My worry in TVET is that the people who are in control of the funding, who make the decisions, do not realise how beneficial technology is for students. I will give you an example: Our N4 and N6 students do not have Internet access. They have to pay. It feels to me at our campus, we are sitting on these benches and have this wonderful view in front of us, but it feels like we cannot get up from the benches. It is open for the lecturers but the students still do not have access and most of our students are bursary students. Therefore, this photo…it frustrates me, because it is not to the advantage of the student. It also angers me, in terms of the people who makes the decisions about funding; why do they not come and talk to us? Why do they not ask us what our needs are? Another example: Our N4 to N6 students do not do computers- they do not have it as a subject (Cleopatra, TVET2)

“Do they investigate this? Do they try to make it easier for both the student and lecturer?” (Desdemona, TVET2). “…why do they not come and talk to us? Why do they not ask us what our needs are?” (Cleopatra, TVET2). I contextualised these questions with reference to the “citizen inclusion” concept of Matavire et al. (2010:160). The authors suggest that little

attempt is made to capture the “true needs” of the end-users during government’s implementation phase of ICT initiatives. Michalski (2013:6) concurs as she observes that there is little effort made by implementers to involve end-users in all the stages of ICT learning systems development and diffusion- user choice are normally restricted to adopt or reject an ICT tool. Matavira and co-authors emphasise this by mentioning the following example:

> A respondent highlighted this through an example of an eGovernment project hosted in a school laboratory at which public access was denied during learning hours and evenings. This effectively rendered the initiative to be of no value to the community. Though this could be a case of citizen exclusion in logistical issues, it is indeed a symptom of wider exclusion of citizens in eGovernment implementation (2010:160).

The example above is consistent with Figure 23: “"We wish we had a computer lab". “We say, “Come study...come study...come study at our college!” The student just has a classroom, a toilet and a cafeteria that is not even a cafeteria. Where must this kid work? Where should he do research? Where should he print?” (Desdemona, TVET2). The responses are suggestive of what Brown describes as the global discourse - in particular the digital divide - in digital technology (2011:10-22). For the participants, the digital divide clearly exists in the context of higher education i.e. the comparisons participants draw with the digital technologies that are available at other TVET institutions and universities, but not at their institution: “I feel at the universities and at many other places it already happens or they are busy considering the option” (Desdemona, TVET2).

By making these comparisons, educators are challenging the technological imperative embedded in the government’s objective to make learners in TVET institutions compatible through ICT in the global community regarding skills and knowledge (DoE, 2004:17). The challenge is not to oppose, but rather to question the government’s attempts and dedication to fulfil objectives. Therefore, the feeling of disempowerment of educators with a deterministic discourse intensifies; they want to use ICT to improve teaching and learning activities, but feel the responsibility of proper ICT provision lies with their institution or government.

Figure 24: Desdemona-"We wish we had a computer lab"

> The name of this photo is, "We wish we had a computer lab". The students stare out of the window, half dreaming about this computer room. They stare at greener pastures at the other side of the campus. Everyone was very excited to have this picture taken. This is our N4 A group. They are our junior students. They were surprised to find out that there is no fulltime computer room for them to go and work in. For me that is a problem. I feel it reflects on the academic delivery. Certain hours of the day, the computer room is available, but these students do not have time the entire day. It does affect the quality of work they do. If I allow a student only one hour a day in a computer lab, I will receive a poor quality assessment. If a student had, for example, 10 hours access to technology, and spent more time on research and populating research…but the student have an hour, he print out the first thing that he sees, but is not necessarily the best standard. Through this picture, they say they want to stare, as the name indicates name of the photo, "We wish we had a computer lab".

Additionally, the following excerpts from Cleopatra's (TVET2) response are consistent with Brown's student participants who voiced their unhappiness with expensive Internet access (2011:123): "Our N4 and N6 students do not have Internet access. They have to pay." and "It is open for the lecturers but the students still do not have access and most of our students are bursary students". The National Student Financial AID Scheme (NSFAS) provide bursaries to South African higher education students; these students are commonly from impoverished backgrounds, hence the difficulty to afford and pay for Internet access. Therefore, it is not surprising that some TVET students and lecturers decontextualize

statements - such as the one made below by the Minister of Higher Education and Training Dr Nzimande- as dubious within their own discourse:

> NSFAS is ideally placed to play a central role in providing loans and bursaries to university and TVET college students, thereby ensuring that poor students can break the cycle of poverty through opportunities that education provides. This is important in meeting the transformation agenda of the country. The economic success of any nation depends on an educated workforce that meets the immediate and future demands of the country while remaining globally competitive (NSFAS, 2012:1).

Blumer's (1969:12) put forth in his *fourth root image*, namely *the human being as an acting organism*, that a person can be an object of his own image. Thus, he can act towards himself and take action towards others directed by the view he have of himself. This allows educators to identify with and define themselves within a particular role, for example, a student experiencing technology as a learning tool. George Mead referred to this role taking process, as a person functioning in the role of the "significant other". It requires an individual to exert certain expectations that adhere to social requirements of the identity he or she takes on (Visagie et al., 2011:47). From the photo-elicitation interviews, it is evident that Desdemona (TVET2) and Cleopatra (TVET2) took on the role of voicing and projecting the ICT needs of their students.

At the risk of reiteration, I again quote a remark and publish a collection of photos produced by Desdemona to affirm the abovementioned: "if you look carefully at my photos, it is not about me as a lecturer… It is about students that do not have access to technology to work". Figure 24 typifies Desdemona projecting her significant other- her students.

Figure 25: Desdemona's students predominantly are the focal point in her photos

4.6 Perseverance

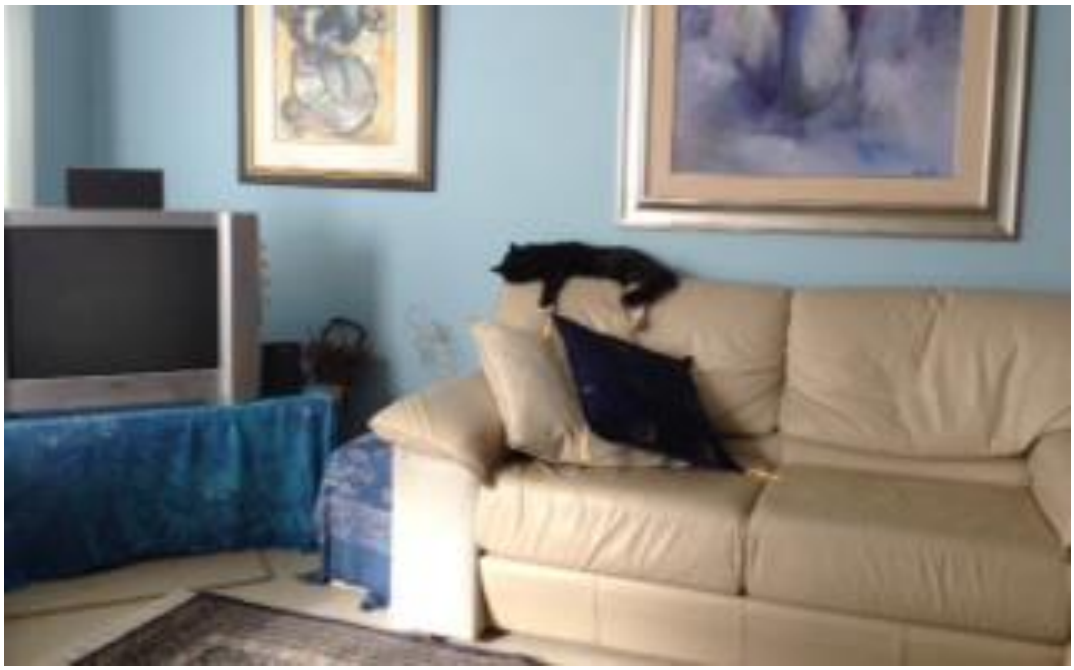

Figure 26: Viola-"RIP!"

> This is if I use a computer in general. I try to sort myself, it is a mental thing. I try to sort myself as you can see, everything is nice and neat. It is decorated beautifully. If I go home at the end of the day, then I feel like that cat; I am completely demoralised. I go home, and I have a feeling of not understanding the computer. I try to improve myself, if I get it right then it is only for a short while but then I am back in that thing of…the technology is changing so fast. I cannot keep up.

Researcher: What title do you think is suitable for this photo?

> REST IN PEACE! In capital letters, the acronym like on the gravestones. I do not believe I will "RIP" there.

Despite struggles and problems with ICT, educators remain resilient in their efforts to utilise it (Hennessy et al, 2010:46). Ross et al. (1999 cited in Davies, 2007:23) report extensive evidence that educators who strongly believe in themselves, set high goals for themselves, and for their students. This strong self-confidence forges educators who persist through obstacles, and achieve successful learning outcomes. For example, one participant, despite feelings that the barriers prevalent in ICT always overwhelm her attempts of improving, persists in her efforts to understand digital technologies. The phrase "I do not believe I will

RIP there" (Viola, TVET1) alludes to the perseverance she has in facing the challenges. The educators believe they will become better and more proficient with technology if they practice. "To understand a computer and become capable of using it better, you need to practice" (Hermia, TVET2). Educators gain new-found confidence with new knowledge they obtain.

Figure 27: Viola- Practice makes perfect

> These young kids are doing the riel dance. To be able to do this riel dance they had to practice. This is the same with computers. To understand a computer and become capable to use it better, you need to practice. The dust part; a computer will never give you a blown up ego, if you do something wrong, then you are back at that feeling of I am struggling again. You quickly get dust in your nose, because you just got it right, I practice to do it. All of a sudden, I do not understand this new program. With a computer, nothing is static- Today you can do something; tomorrow you can try that same thing again. You can take a PowerPoint Presentation; if it is a simple one, you practiced, and you can do it then you feel good- there is your PowerPoint presentation. However, if it comes to the parts where they should slide in, in you do not know how…you were able to do it with the assistance of someone else. Now you sit or stand in front of your class and now it must happen but it is not there then you feel like a worm.

In a study that examined resilient and persevering teachers, Stanford (2001:84) found that teachers' commitment to make a difference in their students' lives is driven by the need to see regular "growth" that occurs "month to month". TVET educators reinforce in themselves the *systematic* progress they wish to see in their students' progress; Hermia's symbolism of the money she patiently "saved monthly" (see Figure 27) to buy a new car, and Viola that "learns everyday" (see Figure 28) hints to the aspect of "growth" and perseverance. However, the participants are aware that perseverance amidst technological challenges is difficult: "a computer will never give you a blown up ego, if you do something wrong, then you

are back at that feeling of I am struggling again" (Hermia, TVET2). The educators' inability to keep up with "increasingly sophisticated technology" (Bladergroen et al, 2012: 113) threatens the perseverance: "All of a sudden, I do not understand this new program" (Hermia, TVET2); "the technology is changing so fast. I cannot keep up" (Viola, TVET2).

Again, as Blumer points out: a human being can act toward himself. For example, a human can "set goals for himself, make compromises with himself" (1969:79-80). By making an indication of things to himself, a person positions himself opposite them and takes action against them by rejecting, accepting, altering, depending how he interprets them. Educators who struggle with technology do not give up, they are aware that reaching the *difficult* goal of becoming ICT proficient, takes practice. Blumer holds that whatever action a person engages in during self-interaction, he points out divergent factors to himself that he has to take into consideration in the course of the action. For example, he identify things that "may obstruct his action" (1969:81). The individual assess all factors, which incur further action. Fast evolving technology, the absence of support during a critical technological encounter, and limited time to practice is obstructive factors that hinder perseverance. In spite of these detriments, participants choose to persevere in their technological struggles.

Figure 28: Hermia's new car is a symbolism of perseverance with ICTs

This photo is an example of…I saved monthly, I started 10 years ago…and I did not think I would save a deposit for a car. I saw the car and I bought it. This is how I feel about a computer: If I look back at where I started with a computer, and where I am today, this is how I feel about a computer. I am proud of my achievement; it is not the best of the best, but I can talk courage into a student that struggles to persevere and not be scared of the computer. I now have the confidence to offer help to someone else, because I achieved after I was so scared of a computer at the beginning.

Figure 29: Viola-"I learn everyday"

A computer for me is a miracle that I do not understand anything about…well not anything entirely, I exaggerate. I am just not very clued-up with a computer. The motto “I learn everyday” for me is an indication that I learn something new every day on a computer. The problem is, you have to practice regularly. Because our lecturing hours is so long, I do not have time to practice it. By the time I am getting to practice, I already forget what I learned or what I was supposed to learn.

4.7 Research limitations

A limitation of the study is the shortage of the randomly selected participants. This is a typical limitation of interpretive research (Brand, 2008:84). The sample population was drawn from a homogeneous group of educators who were invited to volunteer as participants. Educators, who have solid pre-existing positive or negative views of ICTs in their institution, may have a *bias* that is inclusive of the purposive sampling technique. In addition to the risk of the participant bias, I may also have projected my own bias and prejudice into the data (Van Zyl, 2013:197).

Furthermore, the context is vital and relevant only to the TVET educators in this particular "space and time" (Brown, 2011:219) this research investigation was conducted. Both TVET institutions and the Department of Higher Education are about to embark on ICT initiatives and projects to better the technological experience of students and educators. Therefore, educator meanings and identities, if a similar study is conducted in future based on these the outcomes of these projects, might be different to the ones produced in this thesis.

Another limitation is that participants often expressed their general views, experiences and beliefs towards ICT. Their responses were not always framed within an educational context. In order to prevent this, several question prompts were required to steer the responses so that they were relevant to this particular research inquiry. All of the participants, with the exception of one, preferred to respond to the interview questions in their mother tongue; *Afrikaans*. Therefore, some interpretation and meaning within this particular context may have been lost in translating to English. To curtail this, I conducted verification of certain phrases by other Afrikaans-English bilinguals to affirm accurate translation within the proper context. Additionally, I conducted short follow-up interviews with participants to validate the content of their responses.

4.8 Reflections: themes and meaning

In this chapter, I have unveiled the multiple meanings that emerge from the symbolic construction of ICTs by educators in TVET institutions. The meanings that emerged were interpreted from three primary themes identified following the analyses of raw participant data. I revealed the extent to which educator meanings can influence the uptake of technology for educational purposes. I also noted how educators have reciprocal, multiple and conflicting symbolic and visual narratives illustrating their assumptions, beliefs and use of technology. At a micro level, their visual and symbolic expressions were strongly underpinned by the cultural and social identities that prevail and dominate the organisational environment. Furthermore, I demonstrated how institutional management decision making and government policymaking at a meso and macro level, significantly shapes meaning making and technology adoption.

Finally, the *ICT user types (Section 4.1)* and *The general use of ICT in education (Section 4.2)* are closely linked to the main themes *–support*, *frustration* and *perseverance*- that emerged during the thematic analysis phase. The discouse and ICT experience of educators that fit the *Enthusiasts*, *Pragmatists* and *Socialisers* user types, reflect ICT meanings that

emerged from the *support* and *perseverance* themes. Descriptions, experiences and other traits noticeable in educators that fit the *Guardians* and *Traditionalists* user types are reciprocal with ICT meanings interpreted from the *frustration* theme.

CHAPTER 5

5 Recommendations and conclusions

The aim of this thesis was to interpret, reflect and examine the complex and multiple symbolic meanings that educator staff at TVET institutions hold for ICT as a teaching and learning tool. Furthermore, the research study endeavoured to understand how these meanings affect the adoption of ICT by TVET educators. The following research questions were formulated to guide the research study: (1) What are the multiple symbolic meanings in TVET that educators associate with ICT? (2) How do these symbolic meanings affect the adoption of ICT by TVET educators? This concluding and final chapter (a) adresses the intellectual puzzle; (b) provides an overview of the thesis; (c) presents recommendations to motivate better ICT adoption among TVET educators; and (d) identify research areas that can be explored further.

5.1 Addressing the intellectual puzzle

In this section, I address the intellectual puzzle and reflect on the contributions I initially set out to make in this thesis. The aim of this research was to contribute to: (a) an understanding of TVET educators' experiences, views, attitudes, and assumptions toward using ICT for teaching and learning; (b) an understanding of the extent to which TVET educators accept, reject and use ICT in their institution(s); (c) the conceptualisation of best practices to introduce ICT tools in TVETs. My study of ICT symbolism in education builds on influential research (Prasad, 1993, Michalski, 2013; Van Zyl, 2013) that employed symbolic interactionism as a theoretical and conceptual framework to analyse technological encounters. This study further draws from some leading research (Collier & Collier, 1986; Hall et al., 2007; Parker, 2009:9; Van Auken et al., 2010) that used photo-elicitation as a methodology to interpret and analyse meaning. The use of symbolic interactionism and photo-elicitation in this study significantly contributes to a renewed understanding of ICT adoption in education.

The interpretation of meaning in respect of technological encounters was positioned within the context of theories described by Blumer (1969:6-16) in his *six root images* of symbolic interactionism. The following findings were revealed within this context:

- *Human group life*: Symbolism shared by educators in the TVET environment shapes and results in reciprocal meanings of technology. Findings suggest that educators experience similar benefits and frustrations.

- *Nature of social interaction*: Educators alter or revaluate their perspective of technology, depending on the nature of social encounters with others. The nature of support educators receive with their ICT difficulties influences and may change their (positive or negative) perspectives and use of technology.
- *Nature of objects*: The extent to which educators assign meaning to ICTs are profound. For example, "symbolism of anthropomorphism" (Prasad, 1993:1420) exists in educator meaning making. As mentioned, this finding is rather unconventional in symbolic interactionism.
- *The human being as an acting organism*: Educators seem to exhibit multiple identities to make sense of their technological beliefs and meanings. They define themselves within the particular role of a student. Students' technology needs and desires to an extent reflect their own, as they ultimately want to use technology to better the quality of education for students.
- *Nature of human action*: Educators' view of ICT results in the performance of various acts and actions to exhibit meaning. The type of scenarios or events they photographed, and their interpretation of them, are representative of the actions they perform to express their diverse views and meanings.
- *Interlinkage of action*: I used the ICT user types of Birkland (2013) to contextualise the existence of specific technology user types in education. I argued that educators of the same user type have similar ICT behavioural traits and beliefs. On the contrary, the examination of differences between different user types also highlighted the diversity of interactions and meanings that exists among educators.

In addition to symbolic interaction, the following three principles of photo-elicitation (Van Auken et al., 2010:373-388) grounded efforts to meaningfully interpret and uncover meaning:

- *Minimisation of power relations and researcher bias*: Photo-elicitation empowered educators during the data collection process by allowing them to be the authors of their own story. I was not present during the photography phase. Therefore, "participant led visual data production" naturally took place without the researcher's presence (Mannay, 2013).
- *Elicitation of rich and different information*: At first glance, I unexpectedly made an incorrect analysis of some participant photos. Figure 30 is an example: When I first looked at the photo, I expected Cleopatra (TVET2) to provide an anecdote that relates to a positive belief, experience or use of technology. I was surprised to learn the contrary; she narrated an unhappy experience she had with ICT! What makes the construction and interpretation of meaning even more complex is her first words,

"I evidently had a bad day with internet speed". This excerpt and the use of the word "evidently" especially indicate that she considers the photo to be a clear expression of her bad experience. For me, this picture and corresponding response, is a representation of unexpected, different and rich data that photo-elicitation might produce.

- *Effectively involve participants in activities related to educational development in their environment:* As mentioned, government and institutions can use the findings presented in this thesis in the development of evidence-based policies in ICT intervention. In that sense, participants' involvement in this research is meaningful because they contribute to this development. Many of the participants informed me that they hope this thesis will somehow bring improvement concerning technology in their institution, hence their reason for volunteering to participate: "For me, the objective of your research is to determine where change is needed, where does frustration occur, where is improvement needed?" (Desdemona, TVET2).

Figure 30: Cleopatra- "No speed"

> I evidently had a bad day with internet speed. I struggled to download stuff from YouTube. I walked pass this smiley face and turned it around and took a picture of it. I was unhappy about this speed that did not work for me. So it is actually an unhappy face!

The findings in relation to the frameworks of symbolic interactionism and photo-elicitation permitted me to better understand and address the intellectual puzzle. Specifically, educators' symbolic (and visual) narratives allowed me to:

- Show that implementers can use the educators' appreciation for technology to improve ICT adoption. Conversely, they should also be aware that limited ICT support and literacy rates among educators hampers successful adoption.
- Challenge beliefs of government and institutional management that large funding for ICT innovation results in "satisfied" educators who will successfully adopt to ICT. The findings of this thesis suggest that funding is misplaced. If educators are approached directly to find out where ICT innovation will significantly improve teaching and learning practices, funding can be directed appropriately. Consequently, ICT adoption will improve.
- To argue that educators challenge government to fulfil promises of technological innovation to better the overall academic experience. This suggests that educators will adapt to technology if government can manage to deliver ICT goals they set out in policymaking documents.
- Highlight how educators are well aware of the digital divide in the South African Higher Education context. Educators are curious why technology other institutions implement is not made available in their institution. This finding also suggests that educators are willing to adapt to technology if it is made available.
- Show that the digital divide does not only relate to the technological *haves* and *have-nots*, but that it also relates to macro and meso factors such as a government or an educational institution's ability to provide sufficient electricity to power its technology. Consequently, educators doubt the effectiveness of technology due to potential electricity limitations that might constrain its operability. In this case, effective ICT adoption is hindered, as educators prefer traditional methods.
- Reveal that educators do not accept or easily give in to technological setbacks, but are resilient in overcoming problems. Again, government and institutional management can build on such perseverance to improve ICT adoption.

The above mentioned findings stem from participant meanings of educational ICT. The meanings discussed in this research can guide the local and national government to draft policies that might improve the uptake of technology. I consider this essential, as the government's main goal is to develop South Africa's information society by improving ICT literacy rates in Higher Education. An argument central to this study is that implementers should not introduce technology to educators without proper understanding of the symbolic meanings that they ascribe to ICT. These meanings ultimately transpire in ICT adoption and use. An initiative by policymakers to understand the multiple symbolism of ICT among educators will have an outcome of greater inclusion of educators in ICT planning. Such a strategy will inspire educator confidence in governmental ICT initiatives. This might lead to

educators that are more willing to embrace technology for teaching and learning. Finally, within the symbolic interactionism framework, I shed light on the matter of adoption, and contributed to the development of theories and best practices for the introduction of ICT tools in TVETs.

5.2 Concluding thoughts

The use of digital technology in learning and teaching practices is increasing, and educators are central to the process. The adoption of ICT proves to be a complex process that is embedded in the interaction between people and digital technology. From the reported findings of this thesis, we observed oppositional technology discourses between ICT decision makers and educators. ICT problems seem to appear if members from different fields fail to collaborate and engage in pedagogical discussions and objectives. TVET educators question and are doubtful of policymakers' ability to fulfil and reach ICT targets and objectives. The following opposing statements capture the struggles in this discourse:

> We want to ensure that every school has access to a wide choice of diverse, high-quality communication services, which will benefit all learners and local communities. The services provided by the initiative will enhance lifelong learning and provide unlimited opportunities for personal growth and development to all. (DoE, 2004:6).

> It feels like they do not see everything that must be done – what is out there. It feels as it is about rules, stalling progression, and procedures instead of asking, "How can we give our student more access?" For example: our students do not have a workroom. Where they must sit and work? They have to wait until the computer rooms are open in the afternoons (Cleopatra, TVET2)

These discourses are closely aligned to the ICT for educational development agenda. Implementers need to understand that they cannot accomplish successful technology diffusion, by conceptualising it as merely as a "symbol of progress" (Van Zyl, 2013:119); technology uptake occurs in the deeply rooted cultural and social beliefs of educators. This inquiry broadened the research domain by examining, from within a symbolic interactionist framework, the manifestation of meaning that emerges in the teaching and learning activities of TVET institutions. The photo-elicitation methodology was central in providing a visual-interpretive framing of symbolic meaning. In the line of inquiry, issues related to idealism, the digital divide and the technology imperative were unveiled.

Even though the focus of this thesis has been on TVET educators, educators place the technological needs of their students above their own. The following themes seem to proliferate throughout this research: (a) technology is essential for improving students' academic performance, and (b) ICT knowledge is an unquestionably valuable asset, as well as a determining factor in securing students' future employment. Figure 31 and the corresponding narrative illustrates the resulting frustration arising from these needs not being addressed:

Figure 31: Cleopatra- "Shortcomings in programme"

> When she walked across the stage, I took a picture of her with my cell phone. This photo makes me sad because I think about her. She is an achiever; she performs well and will get far in life without computer training. I also know that there are many other students, because we do not offer computer training as a subject in our course, who will quite possibly not make it that far because they will not have the opportunity do a computer-training course on their own. She had computer training, her parents paid for it. She was fortunate to do a computer-training course on the side. This makes me sad about our Programme, it feels as if we have masses that pass, but how many of them can go and do that training. You send them into the workplace, and I am not so sure that some of them can efficiently operate a computer. You can see the masses sit in the background and it feels that they should just continue like this. One hopes that they are not employed at a workplace where the people will be impatient and not willing to help them.

Educators are right in arguing that ICT training should be included in academic programmes, especially since ICT skills are a necessity in securing future employment. Indeed, there is a

shortage in supply to the local labour market of digitally skilled tertiary students (Breytenbach & De Villiers, 2010). Investment in ICT training during tertiary education will stimulate economic growth in South Africa (ibid.).

5.3 The way forward

Some educators ascribe their own inability to operate and understand technology as a detriment that affects the adoption of ICT. Perseverance, however, is parallel to this frustration. Thus, educators take responsibility and want to address the problem. They do so by investing genuine effort to understand and use ICT. Therefore, I consider *Perseverance* the most important theme of the three themes that emerged. *Growth* (or, personal and professional enhancement) has been a central aspect of the Perseverance theme. Educators want their ICT knowledge to "grow", like a "King Protea", but "the conditions need to be right … the sunshine, the ground, the rain, etcetera" (Figure 32). This analogy indicates that government and institutional policymakers need to know that educators *want to* use technology. They should introduce technology, however, with thorough understanding of the social dynamics and cultural beliefs that prevails in the TVET academic sphere. In reaching this understanding, they can strategically implement and plan technology diffusion, which may result in a higher uptake of technology.

Figure 32: Emilia-"Growth" and transformation of ICT knowledge

> That is the King Protea, our national flower. For me the importance here is you once again the impressive final product, and that starts with something so elegant like that beautiful knob. As it grows, it becomes that profoundly impressive flower. There is an element of the intelligence and ability that goes into computers. It starts as something small, that you can actually miss, but ends with this impressive product that have profound impact. It is also ones progression on the journey with computers; if you start, you do not know anything. I remember the first computer that I saw were my father's computer at his work- the mine. It was as big as this classroom; it stood in a giant glass container. Nowadays they are so small. My father told me that he went in the late 50's to London to look at the first computer. It studied in France. It was a huge thing, primitive. This whole process starts with the seed of a Protean- this small little thing. It then becomes a little knob, and then it becomes this beautiful flower. A person's knowledge also grows like that if you put in a little bit of effort, and get help from people that knows how to help you. I cannot grow on my own; my brain does not work that way.

Researcher: Because you are clearly impressed with the process, is it safe to presume that you want to use computers in academics to improve the academic side?

> Yes, you can deliver such a good final product in the academic world, or in the way you impart knowledge in your teaching methods. Only if the process is executed the right way. If it grows the right way like this flower grows. But it does not just grow, a little bit of effort is needed.

Researcher: You mentioned earlier that you need people to grow with you or needs to help you grow, and with help, you will become better…

> Yes. The conditions needs to be right. In the case of this flower- the sunshine, the ground, the rain, etcetera. That things needs to be right. I cannot take on this process by myself.

A first step implementers can take is to engage educators to determine their needs. Educators want implementers to approach them and talk to them, find out what their needs are, as the following excerpts confirm, "…why do they not come and talk with us? Why do they not ask us what our needs are?" (Cleopatra, TVET2); "I cannot take on this process by myself" (Emilia, TVET1). Institutional management can use the impetus of the educators' perseverance and willingness to share their ICT struggles, in conjunction with the following five determinants presented by Karsenti et al. (2002:4) to aid and drive the successful integration and perseverance of ICT. These determinants especially aim to motivate future teachers to embrace ICT confidently into their teaching practices:

- The application of ICT into teaching practices by the instructors of educators in training might motivate the training educators to integrate ICT into their own future teaching practices.
- The presence of ICT knowledgeable educators might inspire a positive perspective of ICT.
- ICT training in the workplace can influence successful integration of technology into teaching practices.
- Educators who had ICT training during tertiary education tend to be more accepting of ICT integration into their own teaching practices.
- Producing an atmosphere of value and expectations of success in integrating ICT into the teaching practices can be a key factor in motivating educators to embrace ICT.

Brown (2011:216) opines that students should be trained to apply ICT appropriately, instead of training students how to use technology, for example not "how to use Microsoft Word", but rather, "how to easily format your assignment". I want to make a similar argument in the context of ICT use by educators: instead of only making ICT available in the institution, educators should be approached and asked how ICT should be implemented to make teaching and learning easy for both educator and student. This concept linked closely to another suggestion of Brown in that technology should be integrated into the curriculum as well as the disciplinary domain. The following response illustrates an educator's notion of integrating technology in the teaching and learning process with the aim of engaging students and addressing potential challenges that might hinder educational objectives:

> They want to have free access to WI-FI if they are on campus. I asked them many times to use their phones to Google the answer to a question that they cannot answers. Let us go and look for the answers. If they ask me, "What does this word mean?" I instruct them to take out their phones and Google it. I think if we can just give them that access to technology, it will lessen my frustration also. It becomes homework; go home, look for a computer, go to the library…If they can do it immediately in the classroom, I can incorporate it into a lesson and build on it. With WI-FI, a lesson can be completed in an hour, but now it takes 2 to 3 days to finish a lesson depending on when everyone gets access to the Internet (Desdemona, TVET2)

5.4 Future research directions

Researcher: I have an idea of the aspects of ICT that you appreciate or value. However, the absence of photos to display this is noticeable. Is it because you predominantly experience frustration that you do not want to display the positive aspects in photos?

> It will be good if you know that I am happy about things, but it is not what you want to change. For me, the objective of your research is to determine where change is needed, where does frustration occur, where is improvement needed? This is my reason for not photographing things that makes me happy because I already have them- it is already funded, it is already implemented. I focused on things that you need to take back to the people that you need to go and talk with about change that need to take place. They need to focus on that. I think that was my objective with this. If I had to capture photos of the things that I am happy with you would have received 180 photos, because I can do my work effectively with present technology (Desdemona, TVET2).

Desdemona's response to my question has me curious about the extent to which photo-elicitation as a methodology influences the nature of data produced in a research project. I coincidentally acquired an idea of the aspects of ICT that she appreciates when I questioned her about her general use of ICT as a teaching tool. The question above ensued after I noticed no photos that are representative of positive experiences or thoughts she might have of ICT. I encouraged participants to capture photos of "people, objects or elements that represent the value of ICT in education" (See Appendix A). I however also made it clear to them that this *category* is only a guide and not a prerequisite; they can produce any picture (within the right ethical boundaries) to express the meaning ICT has for them.

Since participant-collected photos enable researchers to explore participants' interpretation of meaning, a question such as, "what aspects of ICT as a teaching tool do you value?" is sometimes not viable in the line of questioning. In a classic verbal interview, where photographs do not guide the formation of questions, the aforementioned question would have been more suitable. Therefore, should the photo-elicitation methodology not perhaps (at the risk of engaging in narratives not relevant to the research subject) allow for the elicitation of more open exploratory narratives?

Further, I observed elements of "confirmation bias" (Hernandez & Preston, 2013:178) in Desdemona's response. The following excerpt from the response"…but it is not what you want to change. For me, the objective of your research is to determine where change is

needed, where does frustration occur, where is improvement needed?" confirms the observation. Confirmation bias is the tendency to selectively seek evidence of information that conform to one's beliefs. In light of this, I intend to pursue in possible doctoral work, an analytical comparison and investigation between classic traditional interviews and photo-elicitation interviews (Meo, 2010), and how confirmation bias give rise to different ideas of meaning making. The question and response above suggests that the two interview methods (and underlying confirmation bias) could provide diverse response dynamics.

This thesis highlighted the indifference of government and institutional policymakers for local symbols and meanings educators assign to ICT. As a consequence, educator discourses about lack of support in their technological difficulties emerged. Future studies may look to examine the symbolic manifestations or ideologies of technology prevalent in ICT policy framework design, specifically funding norms in ICT innovation. Findings in literature and from participant data in this thesis suggest funding is mismanaged. This perspective may perhaps reveal undiscovered aspects that hinder successful ICT implementation and adoption. Studies may particularly explore the extent to which symbolic interactionism is instrumental for ICT policymaking.

The "distance learning landscape" (Department of Higher Education, 2014:53) is gaining prominence in TVET. E-learning design, implementation and use will certainly be central in this phenomenon. Problematic issues relating educational ICT for *physical* use in education are clearly unresolved. Therefore, it makes one think about the technological challenges that will manifest in the distance learning landscape, and subsequently the readiness of TVET to engage in distance learning. Interactionists can employ the conceptual resources of the interactionist framework to pursue research that examine the identities in virtual academic communities; in particular, meaning making during online technological experiences and encounters.

While it was not the intention of this research to delve into the ICT needs of TVET students, they were central in educators' meaning making and formulation of discourse. Since TVET students are a primary group in the education environment, they are inextricably linked and affected by ICT diffusion. Educators' use of ICT in classroom practice is dependent on their students- in reference to narratives by Desdemona and Cleopatra of how technology can improve the learning experience of students. It will be worthwhile to pursue the symbolic meanings that emerge from students' technological encounters in education.

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Appendices

Appendix A: Participant information letter

Dear Participant

I would like to invite you to participate in a research study exploring the multiple symbolic meanings TVET educators associate with ICT (Information and Communication Technology). I am conducting the study for the fulfilment of a Masters Degree in Information Technology, supervised by Dr Izak Van Zyl, at the Cape Peninsula University of Technology. I can make available my approved research proposal to all participants if required.

Background

The research interest arose in my capacity as a lecturer in Information Technology using, and observing other lecturers using ICT for educational purposes. ICT have varied meanings for educators. This meaning affects educators' attitudes, emotions, perceptions, perspectives, views and experiences of ICT as a teaching tool. The meanings derive from social interacting with other people (learning about these people's experiences and views of ICT) and ICT tools.
ICT is often introduced within the pedagogy of an academic institution while not considering the role and part of the educator in the implementation phase. Subsequently, educators might become resistant to the implementation process, which in turn hinders the adoption of ICT.

Data Collection

Photo-elicitation is the data collection technique I use in this research project. The Photo-elicitation technique involves you, the participant, taking pictures of things and people to express the various meanings you associate with ICT as a teaching tool. These photographs provide an ideal opportunity for a researcher to interpret the symbolic meanings participants associate with ICT.

Purpose of the study

This study seeks to extend understanding of multiple symbolism of ICT in academia. Furthermore, this paper seeks to understand how multiple symbolism influences ICT adoption. Findings in this research may result in the following:

- Review of the use and adoption of ICT in Technical Vocational Education and Training (TVET) institutions.

- Contribute to the conceptualisation of theories for research of ICT tools in TVETs, within an SI framework.

The participant's role

If you decide to participate in the study, I will ask the following of you:

- Take pictures of people and/or objects that express feelings, emotions, attitudes and experiences when using ICT.

- I encourage you to take the picture of the following categories of photographs. These categories however are considerate only as a guideline, you are be encouraged to take any picture (within the right ethical boundaries) to express what ICT mean to you.

    - People, Objects or elements that represent the convenience of ICT in education
    - People, Objects or elements that represents the speed of ICT in education
    - People, Objects or elements that represents the value of ICT in education
    - People, Objects or elements that represents frustration of ICT in education
    - People, Objects or elements that represents the shortcomings of ICT in education

Elements that you can photograph refer to natural and abstract elements. Natural elements may include pictures of the sun, animals, trees, nature, etc. Abstract elements may include pictures of systems, ideas, feelings, processes, etc.

- Respond to the photographs you have taken in an interview that will take approximately one hour (or less) of your time.

Voluntary Participation

Your participation is voluntary and you may withdraw at any time. Your information will be treated confidentially; no information that might identify you will be used in the publication of this study. Furthermore, no emotional or physical harm will befall you during your participation. This study will not affect or interfere with your duties and responsibilities as an educator.

Benefits of the study

While you may not personally benefit, the knowledge gained from your participation may in future help other educators using ICT for educational purposes. With the results and findings, the study can make recommendations to institutional policymakers about the most effective application of ICT for educational purposes. Moreover, the findings can help determine what and how ICT can be effectively utilised to enrich academic delivery.

Arthur Emil Van Der Poll
RESEARCHER

Appendix B: Participant declaration

Participant Declaration

1. I agree to take part in the study on a voluntary basis

2. I read the participant information letter provided. A full explanation has been given about the purpose of the study, its processes and what is expected of me. The researcher has answered questions and queries I have.

3. I understand that I am free to withdraw (without providing a reason) from the study at any time.

4. I can consent to or deny the audio and/or video recording of the interview.

5. My identity will remain anonymous in any form of publication.

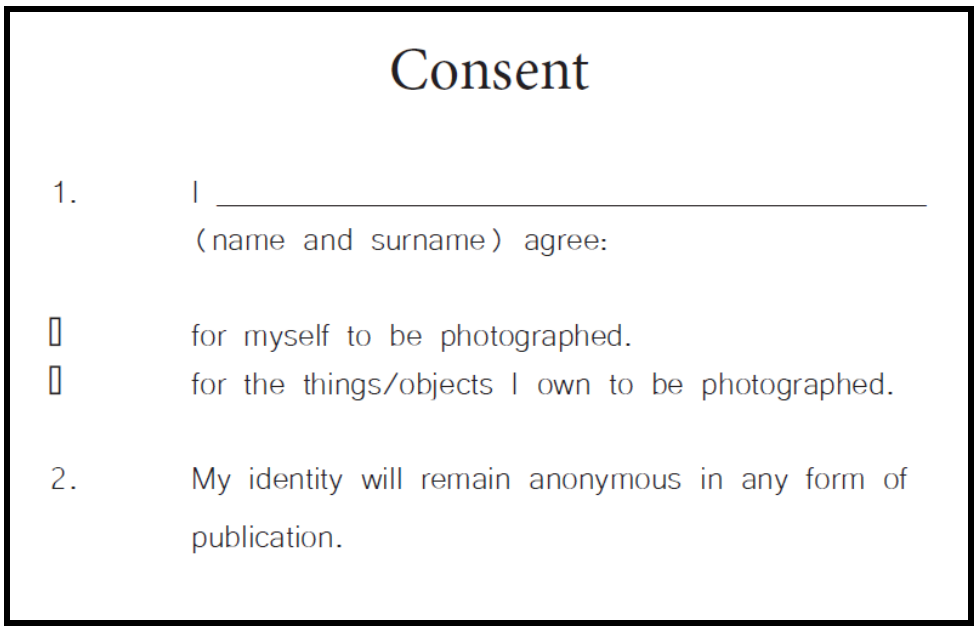
6. I understand that any information linked to my identity or any information provided by me will be kept in a secure location, only accessible to the researcher.

Participant Name: _____ Signature: _____ Date: _____

Researcher Name: _____ Signature: _____ Date: _____

Supervisor Name: _____ Signature: _____ Date: _____

Appendix C: Consent card



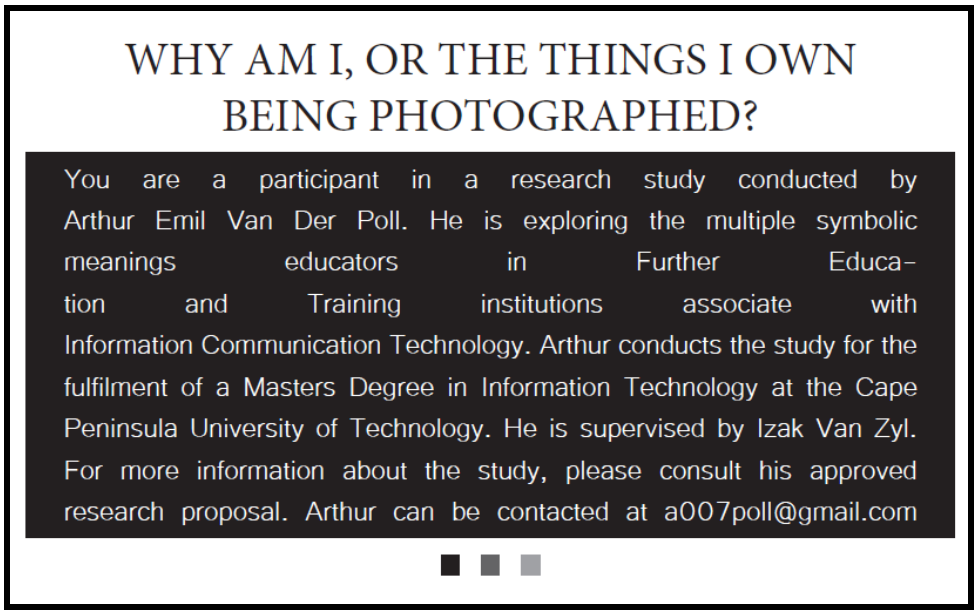
Consent

1. I _____
(name and surname) agree:

☐ for myself to be photographed.
☐ for the things/objects I own to be photographed.

2. My identity will remain anonymous in any form of publication.

Appendix D: Information card



WHY AM I, OR THE THINGS I OWN BEING PHOTOGRAPHED?

You are a participant in a research study conducted by Arthur Emil Van Der Poll. He is exploring the multiple symbolic meanings educators in Further Education and Training institutions associate with Information Communication Technology. Arthur conducts the study for the fulfilment of a Masters Degree in Information Technology at the Cape Peninsula University of Technology. He is supervised by Izak Van Zyl. For more information about the study, please consult his approved research proposal. Arthur can be contacted at a007poll@gmail.com

Appendix E: Sample Interview

R **Can you give me a brief overview of how you use ICT in the classroom, or as a teaching and learning tool?**

Ophelia Well, especially being an IT lecturer, we use many ICT methods. There are computers in the classroom. We use the overhead projector to better display information to the students, to be able to see when explaining work. A lot of different research is conducted. We allow the students to conduct their own research to understand subjects better.

R **you personally…do you provide support if a non-IT lecture needs support. For example, if the PCs is not working, or they do not know how to do a task on the computer? Do you normally help? Are you willing to help?**

Ophelia Yes absolutely. I had to actually do that quite a few times during the exam sessions where non-IT lecturers invigilating computer exams. There were issues occurring with the computers where I was available where I was available to assist them in any way I could. I help to fix the issues because they did not have a good enough understanding of how to do it themselves.

R **during these times you helped them, how would you describe their emotions? What do you think they were feeling?**

Ophelia I would definitely say scared, and frustrated. Frustrated because there is issues in an exam, and they should be fixed before the exam happens. They are scared because they do not know what to do. They are very confuse. They walk out saying, “Can you just help me, and I don’t know what is going on.” You can see they get very flustered because the students are busy writing exams and if they can’t find someone quickly enough it causes infraction on the students’ part.

Photo 1

R **Let us look at the first folder "Convenience". In this folder there is one photo, it is titled "Cater for all needs". It is chocolate in a small container. Can you describe the collation you make with ICT?**

Ophelia The chocolate in the small container is called Carob. It is specifically made for people who are diabetic and cannot eat chocolate. That is where I say it caters for all needs. In an educational environment, if someone is blind or deaf then there is technologies available to be able to assist him or her to get the same education, just in a different form such as for blindness…hearing aid technologies that read out while you type. Therefore, it definitely caters for all needs in an educational environment

R **How does this makes you personally feel, the fact that technology caters for all needs.**

Ophelia It makes me feel very happy, very satisfied with technology because I do not think that anyone's education should be hindered by disability.

Photo 2

R **the next folder we are looking at is "Frustration". In the frustration folder, we have two photos; the first photo is "no green IT" and we are looking at rubbish lying on top of a rubbish black bag. What correlation do you make with ICT here?**

Ophelia I would not say technology is a new thing, but because it is such a fast growing source of information or form of educating people…People tend to look more towards how they can make it bigger better faster you know as soon as possible. They do not think about what effects it has on the environment. So unfortunately, as far as technology and educating people is concerned, the environment is not really taken into consideration many times. Therefore, this photo of garbage is to show that we need to green…not everyone is embracing the idea of Green IT just jet.

R **What do you think about the Green IT initiative at this Campus specifically?**

Ophelia I think it is much underutilised unfortunately. I think it is a great idea; it would work a lot better if everyone were embracing it a lot more open-mindedly.

R **Do you think it affects academic delivery?**

Ophelia Not at all. I think it is, if anything, it sustains it. If you teach people and…you are not only teaching people what they need to know, you are teaching them how to take care of the environment at the same time. Once all the trees are dead and all the animals are dead you find that you cannot breathe money…you know. Therefore, I think it very underutilise unfortunately.

R **the statement that GREEN IT is not utilised or embraced enough, how does this make you feel?**

Ophelia Very frustrated. I believe we were not put here to destroy; we were put here to grow and assist. We are just concerned with greed and how we can better ourselves instead of everyone or everything else. Therefore, it makes me very angry when people are only concerned with the next best thing and how they can make money quicker, better, without any concern of the effects it has on the world.

Photo 3

R **The next photo is titled "unreliable technology" and it is a plate that is broken. What correlation does this picture have with ICT?**

Ophelia For those of us who are familiar with technology, we know that is has quite a few shortcomings still unfortunately. Especially in an education environment that is not sustained properly it is a big factor in injuring the education of the student because there is often software that is not loaded or computers that are broken, or many many instances of students halfway through an exam then the screen…the computer will just shut down. Then they need to start the entire exam all over and it creates a lot of frustration for the students themselves because they are under enough pressure as it is. They are already stressed and now they have to deal with unreliable technology that does not live up to the standards and then they lose all of their efforts in the first go. It is very frustrating.

R **I assume this frustrates you**

Ophelia Yes, in frustrates me because the students look to us for answers and solutions. When a problem like that occurs and we do not have a *go-to* immediate solution for it…I think it is frustrating for all parties.

R **Do you think that the people in charge are doing enough to help relieve this frustration, or all the problems, all the unreliable technology?**

Ophelia No not at all, because…uhm…for example, In South Africa there is Eskom, which we all know, is unreliable. There should have been put in generators many years ago, for when the students…especially in the IT department, we all work on computers.(sic) When Eskom decides to cut the power then all the students have no work to do. They have no technology to work on. It is extremely frustrating, there should be generators in place for things like this, especially for an IT campus that does not have generators to power the IT part of it

Photo 4

R **The next folder we are going to discuss is the "Shortcomings". We have one photo titled "Fear". We are looking at a hiking trail that goes through a grass field. What is the correlation of this photo with ICT?**

Ophelia Very much the fear of the unknown. When it comes to new technologies or even old technologies- when people are not familiar with IT at all, they tend to look at it with a lot of fear. They are not very open-minded trying something new, especially in education.

R **So you think there is educators in TVET that is experiencing fear of unknown technology.**

Ophelia Yes absolutely. I think there are students, IT lecturers… (as well as)…. non-IT lecturers…(who when faced with)…. a new technology... (approach it)… with a lot of fear instead of… quickly, or as quickly as

they should. So this path is just…you know you do not know where you are going. You are fearful of what is on the other end. This is the same with technology, especially in the education environment, you get a new way to project your information and then you sit around being really scared thinking, “oh if something goes wrong, how do I fix it? How am I supposed to help the students now?” It creates a lot of fear.

R **You personally as an IT lecturer and someone who is knowledgeable in the IT field; do you experience this fear of the unknown when it comes to technology?**

Ophelia In certain instances definitely, I think we all do, because there is a lot of technology out there that not anyone on the planet can be comfortable with every technology there is. I think as an IT person, or as IT people, we are a lot more open to discovering new technology because it is just who we are. We definitely approach it with a bit of caution, but I think as IT people we a lot more open to the idea.

R **Do you think non-IT educators should give technology a change at least?**

Ophelia Definitely. I think if they give it a change then they will notice how it can make their life much easier if it is done properly, otherwise it will make their lives difficult.

R **What if technology do not work in an educational institution, what if people cannot adopt to it? What do you think should the people in charge…what should their response be?**

Ophelia I think they should…I am not sure…I think unfortunately not everyone is capable of adopting every form of IT, but patience is about the only thing you can do in that sort of situation. Be patient with the people, take baby steps in trying to show them that is can better their lives rather than hinder it. It is not there to hurt them it is there to help them.

Photo 5

R **The next folder is titled "Speed" and we have two photos. The first photo is titled "faster to learn", and it looks like a super bike. What correlation does this photo have with ICT?**

Ophelia Definitely e-learning. I mean, because of technology in education you can learn abroad anywhere you want…online…especially if a lot unfortunate people don't have the facilities in the education environment, then ICT definitely learned to help them to learn a lot faster, being in different countries. Someone is South African can teach someone is Thailand just be the click of a button.

R **So it makes everything closer and faster.**

Ophelia Yes definitely, it speeds up the learning process for everyone.

R **How does this make you feel?**

Ophelia I am very pleased with it, because it have really brought forward the change to educate people. Where before you complain about, "Ah I can't get there" or "I don't have the resources" or "How do I answers this question", because of ICT

we are able to answers all of those questions now. You don't have to worry about getting to a place because you can just do it over the Internet. If you do not have a library nearby then you just Google it. Therefore, it definitely helped the education environment.

R **Do you think that other TVET educators, non-IT lecturers and IT lecturers share this opinion that technology sometimes pleases a person, which it helps and results in progression in education?**

Ophelia I hope so, but I know that there are obviously a few that still adopt the old ways of rather going to a library, pick up a book. Unfortunately, with the Internet having good information, there is a lot of false information available as well. If someone does not have to right skills of how to properly research a topic, they can be given the wrong information.

Photo 6

R **In the same folder titled "Speed", we have a second photo titled "well build machine". There is a dog in it and it is a husky breed. Am I right?**

Ophelia Yes. It is called a Malamute.

R **what is the correlation with ICT?**

Ophelia Well this dog specifically is a very well build machine. She is perfect for surviving any sort of conditions, very strong, and really be able to make your life a lot nicer. And that is my correlation with ICT in education; if you have technology in an environment that is built properly, supported properly, and updated to the current technology and software all the time, then it can really makes people's life easier cause they will have the best of everything as it comes out.

R **Based on your description, how does this makes you feel?**

Ophelia I think it is wonderful. It makes me feel enthusiastic about where technology can take us. Like I said if we are prepared to always update the current technology, we have and keep it in line with where the world is going we can definitely do great things.

R **Do you think that the people in charge of technology implementation is doing what you just described?**

Ophelia Not at all. Not our particular government of institution anyway. Unfortunately, keeping technology up to date does get expensive. If you are not willing to go the extra mile, and spend the extra dime then you are never going to go where you need to be because. Even though it cost a bit more to update every year, or every two years, it still in my opinion cost a lot less then…cause to update once every year, once every two years…then you uphold the current technology that you have. However, if you keep the same computers and technology for 10 years, it is going to cost you a lot to have you replace everything. I do not know if people can just adopt the thought of keeping up to date rather than replacing it. It would definitely help.

R **Why do you think the parties responsible, or the parties making the decisions are enable to do all the things you just described.**

Ophelia Well, you cannot do much if you are not educated properly. Therefore, I definitely think that is a big factor. In addition, greed! They are not interested in bettering the lives of other people other than their own. Therefore, they are

uneducated and greedy. They will never…not in this country, not for many decades will we be able to further ourselves with technology.

Photo 7

R **The last folder we are looking at is titled "Value". The first photo is a nature photo with mountains in the background and a waterfall that is falling into a dam. What is the correlation with ICT?**

Ophelia Well, just like a waterfall that nourishes the earth…without it everything around it will just die. This is how I feel about IT in an education environment. It has really created so much value in education; nourishing it, making it grow, giving us new and better ways to educate learners. I think it definitely brought a higher level to education.

R **What emotions and feelings are you experiencing right now if you look at this picture?**

Ophelia Exited. I am very excited about what new technologies can bring because if there is one thing about IT; it is the fastest growing element on the planet now. It exiting to see what new will come out of it.

R **What title do you think is suitable for this photo?**

Ophelia "Making the world a better place"

R **So I can assume that computers make the world a better place.**

Ophelia Definitely

R **I assume that you are also aware of the negativities of ICT.**

Ophelia Absolutely, but I definitely think from an educational point of view it makes education a better place.

Photo 8

R **The last photo is a mountain…it is titled "landmark always be around". What is the correlation with ICT here?**

Ophelia Well because this is a photo of Table Mountain and it is so well known, I am pretty sure it is not going to go anywhere soon *laughter*. I feel about IT in education, well IT in general the same way. It has become quite a landmark in

the world where…uhm…there is not going back from here. There is only pushing forward; bigger, better, what is next. It will always be around.

R **The fact that computer technology will always be around, how does this make you feel.**

Ophelia honestly I am in two minds about it, because in one I know it makes everything better and easier…well, a lot of things very much easier especially for educating students, but is it also unfortunate to a certain degree- I think we've lost the human element of ourselves to a certain degree because of IT. People do not want to go outside and smell the roses anymore. They want to rather stays inside and find an app that smells it for you! So I think we have lost a bit of the human side to ourselves but as far as education is concerned I definitely think it is the way to go and move forward.